# EXECUTIVE SUMMARY

## Draft Environmental Impact Statement
## Forest Plan Revision
## Chippewa and Superior National Forests

Eastern Region
Milwaukee, Wisconsin
April 2003

**Responsible Agency** USDA Forest Service

**Responsible Official** Randy Moore, Regional Forester
310 W. Wisonsin Avenue, Suite 580
Milwaukee, WI 53203

**For further information contact** Duane Lula, Forest Planner
Superior National Forest
8901 Grand Avenue Place
Duluth, MN 55808
218/626-4300

**Chippewa National Forest** Beltrami County
Cass County
Itaska County

**Superior National Forest** Cook County
Koochiching County
Lake County
St. Louis County

**Abstract:** This is the summary for the draft environmental impact statement (EIS) documents analysis of seven alternatives developed for programmatic management of the land administered by the Chippewa and Superior National Forests. The Forest Service has identified Alternative E as the Preferred Alternative.

# Table of Contents

**Introduction**.....1

## Chapter 1 Purpose and Need

**1.1 Proposed Action** .....2
**1.2 Decisions to be Made** .....2
**1.3 Purpose and Need for Change** .....2
**1.4 Public Involvement and Cooperative Planning** .....5
**1.5 Issues** .....5
**1.6 Issues Not Addressed in Detail** .....8

## Chapter 2 Alternatives

**2.1 Introduction** .....9
**2.2 Developing Alternatives**.....9
**2.3 Elements Common to all Alternatives**.....11
**2.4 Alternatives Considered in Detail**.....16
**2.5 Summary of Annual Estimated Vegetative Treatment Outcomes and Activities**.....24

## Chapter 3 Affected Environment and Environmental Consequences

**3.1 Introduction**.....26
**3.2 Forest Vegetation**.....26
**3.3 Wildlife**.....29
**3.4 Timber**.....38
**3.5 The Role of Fire**.....39
**3.6 Watershed Health**.....41
**3.7 Special Designations**.....44
**3.8 Recreation**.....45
**3.9 Social and Economic Sustainability**.....47
**3.10 Summary of Environmental Effects, Outcomes, and Outputs**.....49

# Introduction

This Executive Summary provides an overview of the Draft Environmental Impact Statement (EIS) for revision of the Chippewa and Superior National Forest's Land and Resource Management Plans (Forest Plans). This Executive Summary also provides background for reviewing the separate Proposed Forest Plans developed for each Forest.

The Chippewa and Superior National Forests are located in northern Minnesota. Both Forests are within a day's drive from the Minneapolis-St. Paul metro area and both are the focus of demands for various forest benefits such as recreation, cultural, timber, and special forest products. A large portion of acreage on both Forests is in lakes, streams, and wetlands. The Chippewa National Forest includes 666,325 acres of National Forest System land in Beltrami, Itasca, and Cass counties. The Superior National Forest contains over 2.1 million acres of National Forest System lands located in Cook, Lake, Koochiching, and St. Louis Counties. The Boundary Waters Canoe Area Wilderness (BWCAW) makes up approximately one-third of the Superior National Forest. Management direction for the BWCAW will not be changed as part of this Forest Plan revision.

Two major sources of direction for this effort are the National Forest Management Act and the National Environmental Policy Act. Both provide guidance on the process of revision and the content for analysis. The National Forest Management Act requires an interdisciplinary approach to assure coordination of multiple-uses including outdoor recreation, range, timber, watershed, wildlife and fish, wilderness, sustained yield of products and services. The National Environmental Policy Act requires a systematic decision-making process with public involvement, issue identification, development of alternatives to address issues, and analysis of environmental impacts of alternatives.

The Chippewa and Superior NF Forest Plans are being revised under the existing planning rule that was adopted in 1982. Generally, Forest Plans are to be revised every 10 to 15 years to address changed conditions and new information. The current Forest Plans on the Chippewa and Superior National Forests were implemented in 1986. Since that time, there have been considerable changes in conditions on the two Forests, shifts in public demands, technological advances, and a better understanding of forest ecosystems. These changes are reflected in the issues addressed by this revision. One of the most notable changes is the role of landscape ecosystems as a key component in the analysis of the alternatives in the Draft EIS and the definition of desired conditions in the Proposed Forest Plans.

Following the direction of the National Environmental Policy Act, the Forest Service is conducting environmental analyses for Forest Plan revision. The Notice of Intent (NOI) published in August of 1997 officially announced the proposal to revise the two Forest Plans. The Draft EIS states the purpose and need for Plan Revision, discloses a description of the issues to be addressed, the alternatives being considered to respond to the issues, and an analysis of potential environmental effects of each alternative. The Draft EIS also identifies the alternative that is preferred by the Regional Forester.

Based on the Preferred Alternative, the Proposed Forest Plans describe desired conditions, assign measurable objectives with timelines, provide specific standards and guidelines as to how to achieve the desired conditions, and then outline a program for monitoring and evaluating results of implementation. Implementation of the Proposed Plans is dependent on funding. The Forests have not typically been fully funded, receiving 55 percent of the necessary budget to fully implement the 1986 Forest Plans.

During the 90-day comment period following release of the Draft Environmental Impact Statement, the Forest Service will accept written comments about the Draft EIS and the Proposed Forest Plans. Based on the responses received during the comment period, the planning team will revise the Draft EIS to produce a Final EIS. Selection of an alternative to implement as the revised Forest Plan will be based on the analysis in the Final EIS. A full description of and the rational for the selected alternative will be presented in a Record of Decision.

# Chapter 1 Purpose and Need

## 1.1 Proposed Action

The Forest Service proposes to revise the Forest Plans (Land and Resource Management Plans) of the Chippewa and Superior National Forests (NF) that were approved in 1986. In conjunction with laws, policies, executive orders, and Forest Service Manuals and Handbooks, revised Forest Plans would establish direction for managing natural resources for the next 10 to 15 years on National Forest System (NFS) land. Direction in these manuals, handbooks, or other Forest Service directives is applied to Forest Plan implementation but is not repeated in the Draft EIS or the Proposed Forest Plans. On the Superior National Forest, management direction in the Boundary Waters Canoe Area Wilderness (BWCAW) would not change as part of this Forest Plan revision.

## 1.2 Decisions to be Made

### 1.2.1 Six Key Decisions

Forest plans make six key decisions (36 CFR 219, 1982 regulations):

1. Forest-wide multiple use goals and objectives
2. Forest-wide management requirements for protecting resources
3. Management area direction
4. Land suited and not suited for timber management (including the allowable sale quantity of timber)
5. Monitoring and evaluating requirements
6. Recommendations to Congress, such as wilderness designations

### 1.2.2 Management Direction Established in Forest Plans

There is a hierarchy to the management direction provided in a Forest Plan. Forest-wide direction is applied across all areas of the Forest. Each subsequent level of management direction below the Forest-wide direction provides increasingly specific guidance used in analysis and implementation of project level decisions.

Figure 1.1 on the next page illustrates the relationship of different management direction in the Forest Plan.

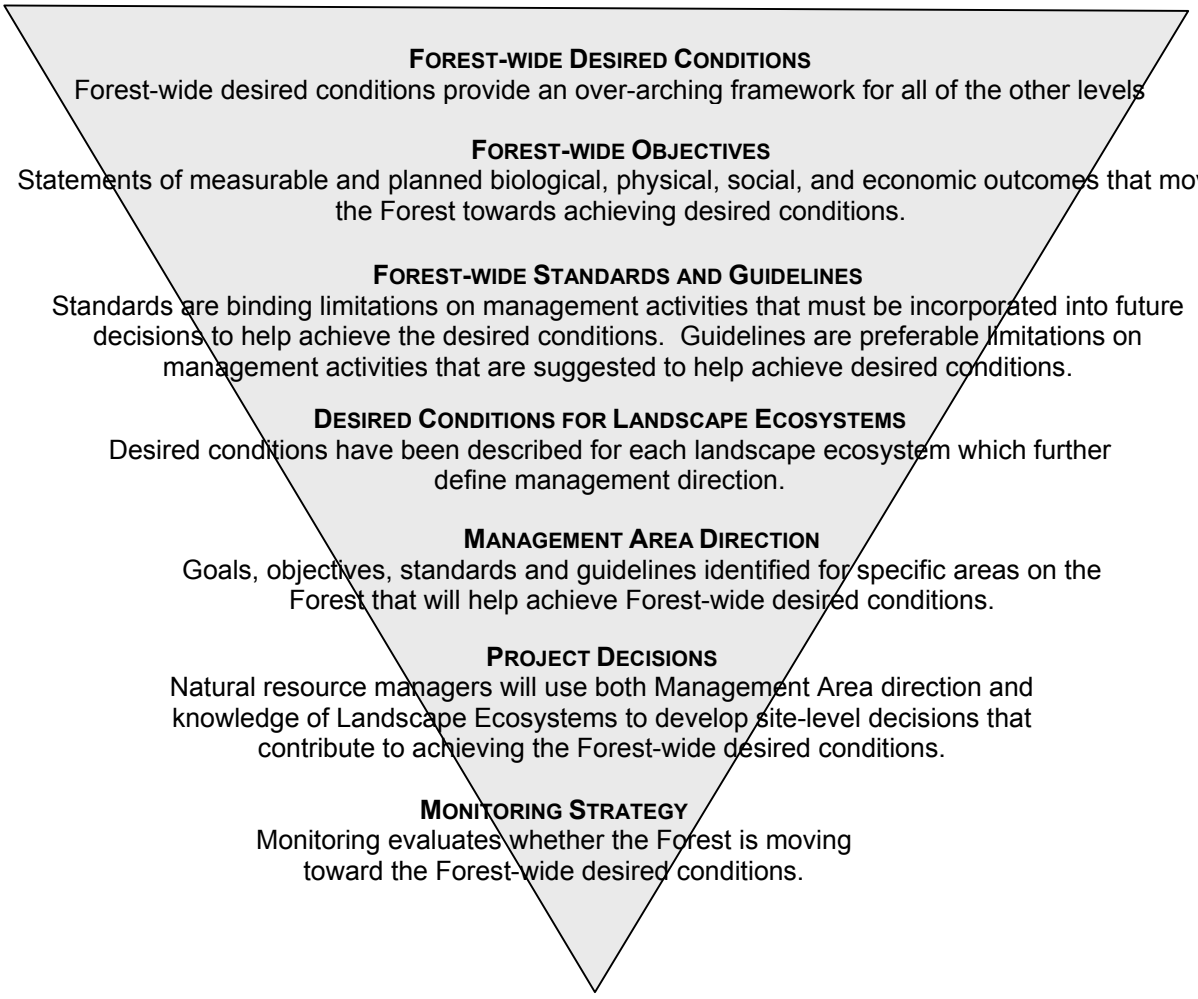
### 1.2.3 Responsible Official

The Regional Forester is the Responsible Official for the analysis and decisions for Forest Plan Revision. Based on analysis in the Draft EIS, public comments, and analysis in the Final EIS, the Regional Forester will select an alternative to be implemented in the revised Forest Plans. The local Forests conducted the analysis, developed alternatives, and prepared the Draft EIS.

## 1.3 Purpose and Need for Change

The current Forest Plans were approved in June 1986 and have since been amended. In the past 16 years, the Chippewa and Superior NFs have successfully implemented site-specific projects with the management direction in current Forest Plans, and resources are in good condition. However, there is concern that continuing to follow management direction in the current Forest Plans may not allow the two Forests to reach their desired conditions and could potentially result in adverse impacts in the long run. Changes in Forest resource conditions, changed public demands, new ecosystem information, new management approaches, and shifts in national Forest Service policy also result in the need to revise current Forest Plans.

## Figure 1.1. Hierarchy of Management Direction in a Forest Plan




**Purpose:**

The purpose of the proposed action is to have revised Forest Plans that guide all natural resource management activities on the Chippewa and Superior National Forests and that:

- Meet the objectives of federal law and regulations
- Respond to the public's needs and desires
- Manage ecosystems to provide for long-term sustainability

### 1.3.1 Federal Planning Regulations

The current Forest Plans were approved in June 1986 and have since been amended. As of March 2003, there are 31 amendments to the Chippewa Forest Plan and 10 amendments to the Superior Forest Plan. The National Forest Management Act requires the Forest Service to revise forest plans every 15 years.

## 1.3.2 Changed Conditions and New Information

The public's interest in how national forests are managed has increased. Public demands for forest products and services have changed since 1986. The amount and kind of demand has changed for forest commodities, such as pulpwood, and for non-consumptive services, such as recreation.

Forest conditions have changed substantially since 1986. Insect infestation (such as spruce budworm), fuels build up, drought, blowdown, and flooding have changed conditions on the Forests in ways not anticipated in current Forest Plans.

There is new information about the Chippewa and Superior NFs and new forest management approaches. New scientific information has been published since 1986, including research, assessments, and inventories issued by the Forest Service, the Minnesota Department of Natural Resources (DNR), universities, and other research organizations.

The landscape ecosystem classification from the Terrestrial Ecological Unit Inventory (a national inventory) is new information and the concept of the range of natural variability (RNV) has been recently advanced as a means of analyzing landscape conditions and their ability to maintain long-term ecological sustainability. Information about the condition of ecosystems on a broad-scale was recently developed by the Great Lakes Ecological Assessment. The Forest Plan revision process used these new sources of information.

Since 1986, agency direction has shifted the course of agency plans and programs from output-centered management, concentrating on products, to outcome-centered management, concentrating on the long-term condition of landscapes. The *Forest Service Strategic Plan 2000* provides purpose and context for managing national forests. The Forest Service adopted ecosystem management as an operating philosophy for national forests and grasslands in 1992. This shift affects the programs on the Chippewa and Superior NFs.

## 1.3.3 Need for Change in Management Direction

There is a need to revise the current Forest Plans to address changes that have occurred since the 1986 Forest Plans were implemented. An interdisciplinary team of Forest Service resource specialists and planners worked with representatives from other tribes, agencies, and members of the public to identify key areas that need to be changed in the current Forest Plans.

### Need for Change Topics

#### Diversity

Along with new information, management direction needs to incorporate ecosystem processes, such as the role of prescribed fire and timber harvest in emulating natural disturbances. There is a need to modify management direction to address bio-diversity at both the site and landscape levels rather than using a species-by-species or community-by-community management approach to protecting rare natural resources.

#### Wildlife and Fish Resources

There is a need to develop management direction for managing whole ecosystems for a variety of wildlife habitats at large landscape scales and to revise the list of management indicator species.

#### Vegetation Management Practices

There is a need to emphasize both even-aged and uneven-aged management, emphasize site suitability, and better integrate fire management into direction for vegetation management practices.

#### Timber Resources

There is a need to recalculate suitable acres for timber production, review standards and guidelines, recalculate timber yields per acre to better reflect actual removals, and arrive at an allowable sale quantity (ASQ) that incorporates all of these factors.

> ***Allowable Sale Quantity (ASQ)*** is a maximum limit on volume that the National Forests can sell within a decade while meeting the requirements for multiple-uses and resource protection. ASQ is not a goal for production.

**Water Resources**
There is a need to revise management direction to integrate composition and structure with hydrologic function, to develop management direction for both entire watersheds and site-level projects, and to develop management direction for maintaining and restoring riparian functions.

**Recreation Resources**
There is a need to determine the mix of forest settings and associated recreational opportunities, scenic integrity level, the use and restrictions on recreational motor vehicles, and the level of water access development that the two National Forests will emphasize.

**Socio-economic Considerations**
There is a need to address current economic needs, social conditions, expectations, and values of individuals, tribes, government agencies, surrounding communities, and organizations.

**Other Considerations**
During Forest Plan revision, management direction for additional topics may also be changed. For some of these topics, Forest Plan revision will not make major changes to the current management direction, however some small changes are likely. For other topics that currently do not have management direction, desired conditions, objectives, standards, and guidelines may be developed.

Greater cooperative stewardship with other land managers is key to meeting these needs because of intermixed ownership on the Chippewa and Superior National Forests.

## 1.4 PUBLIC INVOLVEMENT AND COOPERATIVE PLANNING

Throughout the revision process the Forest Service has consulted with federal, state, tribal, municipal, and county government agencies as well as with private organizations and individuals. A special effort has been made to consult and involve the bands of the Minnesota Chippewa Tribe that reside within and around the Forests' boundaries. The Forests also consulted with personnel from universities and from the research and the state and private forestry divisions of the Forest Service.

The public has been informed of the revision process through regular newsletters, news releases, open houses, workshops, public meetings, and documents posted on the Internet. Public input has come in the form of letters, participation in workshops, and at meetings during several stages of the revision process, including:

- Identifying needed change
- Responding to the Notice of Intent
- Identifying issues
- Developing preliminary alternatives
- Reviewing preliminary alternatives
- The public will also review and comment on this Draft EIS and Proposed Forest Plans (public comments will be addressed in the Final EIS).

## 1.5 ISSUES

### 1.5.1 Introduction

Issues stem from the need for change topics previously summarized in the "Need for Change in Management Direction" section. Public involvement, internal discussion, and analysis were also used to identify issues in Forest Plan revision.

An ***issue*** is a potential conflict from an effect on physical, biological, social, or economic resources. In terms of a Forest Plan, an issue may involve differing opinions about how to manage forest resources.
An ***issue indicator*** is a measurable outcome associated with a particular resource issue that could result from proposed management.

## 1.5.2 Forest Vegetation

This issue encompasses various aspects and outcomes of vegetation management, including composition, age, and spatial patterns.

**Forest Age and Composition**
There are differing opinions about what forest ages and forest tree species will provide adequate forest structure and biodiversity while providing the social and economic needs of people over the long term.

Forest Plan revision will determine the long-term goals for young, mature, old, and old-growth forests and for the species composition of forest communities, types of forest vegetation communities, and distribution of the communities. Revision will also determine if old growth will be actively managed, and if so, how it would be managed. Another decision to be made is if old growth will be permanently allocated to a location or be transient on the landscape.

> ***Forest Composition*** refers to all the plant species found in a stand or in a landscape, including trees, shrubs, forbs, and grasses. Generally, the complexity of a forest stand reflects the robustness of the stand to deal with disturbances and maintain ecological functions.

**Forest Spatial Patterns**
There are differing opinions about what forest spatial patterns would provide for ecosystem integrity as well as the social and economic needs of people. Forest Plan revision will establish long-term goals for the size and distribution of forest patches.

> ***Forest spatial patterns*** refer to the size, shape, and arrangement across the landscape of:
>
> - Forest types, habitats, and vegetation communities
> - Disturbances, both natural and forest management

## 1.5.3 Wildlife Habitat

There are differing opinions about how the Forests should be managed for the full array of wildlife species and habitats, whether rare or common, and what habitats and species should be emphasized. Forest Plan revision will establish goals for the types, amounts, distribution, spatial pattern, and function of wildlife habitats. This will include how, where, and to what extent rare species and their habitats will be protected, enhanced, or restored.

Federal regulations require the Forest Service to maintain or improve biological diversity at the genetic, species, and ecosystem levels and to maintain viable populations of existing native and desired non-native species. Specifically the Forest Service must provide habitat to sustain viable populations of all native and desired non-native species.

## 1.5.4 Timber

There are three aspects of timber management at issue, including uneven-aged versus even-aged management, timber supply, and mix of forest products.

> ***Uneven-aged management*** is a planned sequence of treatments designed to maintain and regenerate a stand of trees with three or more age classes. An example is selection harvest that creates or maintains multiple age classes.
> ***Even-aged management*** results in stands in which the trees are essentially the same age. Examples of even-aged management are clearcutting and shelterwood harvests.

**Uneven-aged vs. Even-aged Management**
There is debate about how much even-aged management can be used while providing for ecological integrity as well as the economic and social needs of people in the long term. Forest Plan revision will establish how much even-aged management (especially clearcutting) may be used and in what forest types and landscape ecosystems it may be used over time.

### Timber Supply

There are divergent opinions on how much timber the Chippewa and Superior National Forests can supply to meet social and economic needs of people without adversely affecting ecosystem integrity. Forest Plan revision will determine a sustainable level of timber harvest that the Chippewa and Superior National Forests may supply over time. Revision will also establish the acreage and location of land that is suitable for timber production.

### Mix of Forest Products

There are different views on what mix of forest products will adequately provide for local mills over the long term. Forest Plan revision will determine the mix of sawtimber and pulpwood that the Chippewa and Superior National Forests may supply.

## 1.5.5 The Role of Fire

There are differing opinions about the use of prescribed fire on the Chippewa and Superior National Forests. Forest Plan revision will determine how, where, and to what extent prescribed fire may be used to mimic natural processes and to restore natural processes and functions to ecosystems, and to reduce fuels.

***Prescribed fires*** are intentionally set by forest managers under controlled conditions to meet specific natural resource objectives. These are also referred to as management ignited fires. ***Fuels*** are anything that will burn such as trees, branches, grass, and pine needles.

## 1.5.6 Watershed Health

The issue of watershed health encompasses watershed management and management of riparian areas and fish habitat.

### Watershed Management

There are divergent opinions about how much emphasis to give watershed health in forest management. Forest Plan revision will determine the approach taken for management activities in watersheds. Measures to protect and enhance watersheds could remain either as they are in the current Forest Plans or provide direction for enhancing and restoring watersheds.

### Riparian and Fish Management

There is debate about how much emphasis should be placed on riparian areas and fish habitat in forest management. Forest Plan revision will determine if the approach to management in riparian areas will stay as it is in the current Plans or if the approach will change to provide direction to enhance and restore riparian functions. Revision may change the management direction for riparian areas, including the size and location of riparian management zones. Forest Plan revision will also develop direction for the role of Forest Service managers in managing fish habitat with other agencies and American Indian tribes. This direction may include objectives for maintaining, restoring, and enhancing habitat for fish, including rare species.

## 1.5.7 Special Designations

During planning, the Forest Service must evaluate areas of the Forests for special designation including potential wilderness or potential research natural areas.

### Potential Wilderness Additions

There is debate about how much designated wilderness the Chippewa and Superior National Forests need to provide for a range of recreational opportunities and wildlife habitats while at the same time providing for consumptive forest uses. Forest Plan revision will determine which, if any, additional areas will be recommended as designated wilderness.

Forest Plan revision may result in recommended areas for additional wilderness on the Forests but only Congress can designate wilderness. The Forest Plan revision process will not change current management direction for the BWCAW.

### Potential Research Natural Area Additions

There is debate about how many Research Natural Areas on the Chippewa and Superior National Forests are needed to provide for biodiversity and research opportunities. Forest Plan revision will determine which, if any, additional Research Natural Areas will be recommended for establishment.

## 1.5.8 Recreation

### Recreational Opportunities and Forest Settings

There are differing opinions about which recreational opportunities and forest settings should be emphasized on the Chippewa and Superior National Forests. Forest Plan revision will establish goals for recreational opportunities and associated forest settings, specifically the quantity and location of each forest setting.

### Scenic Quality

There are many ideas of what a 'natural' appearing forest looks like and how much emphasis there should be on scenic integrity in forest management. Forest Plan revision will determine management direction for maintaining, enhancing, restoring, and monitoring scenic integrity. Revision will also establish Scenic Integrity Objectives across the Forests, which guide the amount, degree, intensity, and distribution of management activities needed to achieve desired scenic conditions.

### Recreational Motor Vehicles (RMV)

There is debate about the level of RMV use that would provide an adequate range of recreational opportunities while not adversely affecting the environment. Forest Plan revision will determine the management direction for RMV use on roads and trails as well as cross-country travel.

> ***Recreational motor vehicles*** (RMVs) include off-highway motorcycles, off road vehicles, all-terrain vehicles, and snowmobiles.

### Water Access

There are different public opinions concerning the amount and intensity of water access development that should be provided on the Chippewa and Superior National Forests. Forest Plan revision, taking ecological, social, and economic criteria into consideration, will establish management direction for the quantity and types of access to bodies of water.

## 1.5.9 Economic and Social Sustainability

Key components of this issue that are being analyzed include interdependent ecological, social, and economic factors that work together to allow goods and services to be produced without impairment to the long-term productivity of the land.

### Economic Sustainability of Local Communities

Forest Plan decisions contribute to economic sustainability by providing for a range of uses, values, products, and services. At the same time, forest plan direction must be consistent with ecologically sustainable. Forest Plan revision will determine the mix of uses, values, products, and services that the Chippewa and Superior National Forests could provide over time.

### Social Sustainability

Social sustainability relates to the ability of human communities to adapt to changing conditions. Forest Plan decisions contribute to social sustainability by providing for a range of uses, forest settings, visitor experiences, products, and services. At the same time, forest plan direction must be consistent with ecological sustainability. Forest Plan revision may affect land allocations, management actions, uses, values, products, and services provided by the Chippewa and Superior National Forests.

# 1.6 Issues Not Addressed in Detail

Although raised by the public, employees, or other agencies, some issues are not addressed in the Draft EIS for a variety of reasons. These included: Management of the BWCAW, Planned Ignition for Prescribed Fire in the BWCAW, Wild and Scenic River Recommendations, Special Uses, and Minerals Management. Generally, the management direction for these resources will be carried forward from the amended 1986 Forest Plans to the revised Forest Plans

# Chapter 2 Alternatives

## 2.1 INTRODUCTION

This chapter describes and compares the alternatives considered for the Proposed Forest Plans. Alternatives provide a framework for analyzing different ways of meeting the purpose and need and addressing the issues discussed in Chapter 1. In Forest Plan revision, each alternative has a different approach to managing natural resources on the two National Forests. The Proposed Forest Plans are based on the preferred alternative.

## 2.2 DEVELOPING ALTERNATIVES

The Chippewa and Superior National Forests considered a broad range of reasonable alternative management approaches based on the following criteria:

- Alternatives are distributed between minimum and maximum benchmarks.
- Alternatives respond to the issues raised during the planning process.
- Alternatives respond to regional management direction.
- A range of outcomes and outputs would result from the alternatives.

### 2.2.1 Process

In 1997, the Forest Service issued a Notice of Intent (NOI) to revise the current Forest Plans. The NOI informed the public about the formal revision process. An initial proposal of how to change the current Forest Plans was made in the NOI. The Forests solicited comments or suggestions from the public on the proposal for revising the Forest Plans and possible alternatives for addressing the issues associated with the proposal. These public comments helped frame the alternatives and analysis in the Draft EIS. Figure 2-1 on the next page illustrates the alternative development process.

### 2.2.2 Alternatives Eliminated from Detailed Study

Twenty-one alternatives were considered during the initial analysis process. Some of the alternatives considered were developed internally and some were proposed by outside groups. Some of these alternatives had similar themes, so they were combined. Other alternatives were eliminated from detailed study, including some alternatives that involved harvesting more timber than could be sustained over time, allowed for no harvest, or mandated a watershed-based management approach.

**Figure 2.1 General Strategy for Identifying Management Approach for Revised Forest Plan**

# 2.3 ELEMENTS COMMON TO ALL ALTERNATIVES

Seven alternatives were studied in detail. They have a number of elements in common.

## 2.3.1 Laws, Regulations, and Policies

To be considered, alternatives must:

- Meet the minimum management requirements of 36 (Code of Federal Regulations) CFR 219.27 for development, analysis, approval, implementation, monitoring, and evaluation of forest plans
- Recognize the unique status of American Indians and their rights retained by treaty with the United States
- Meet, as a minimum, the Minnesota Forest Resource Council site-specific guidelines for forest management
- Continue current management of the Boundary Waters Canoe Area Wilderness on the Superior National Forest in accordance with wilderness legislation and the Boundary Waters Canoe Area Wilderness Management Plan
- Meet minimum health and safety standards

Fire management plans for each Forest will continue to be developed and updated on a yearly basis.

## 2.3.2 Wild and Scenic Rivers

All alternatives would manage the previously identified potential Wild and Scenic Rivers in a manner that would preserve eligibility for designation.

## 2.3.3 Landscape Ecosystems

A new component to national forest management in this forest plan revision process is the Landscape Ecosystem classification. All alternatives use the concept of Landscape Ecosystems (LE), except Alternative A. The following ecosystem objectives have been developed for each LE for each alternative:

- Age classes – Percent of an LE dominated by an age class
- Species diversity – Percent of an LE dominated by a species
- Stand diversity – Percent of an LE dominated by a forest type

> ***Landscape Ecosystems*** are the land and vegetation systems that occur naturally on the landscape. Vegetation management direction for specific landscape ecosystems helps to provide an ecological basis for planning.

Every alternative also has a goal of providing for a minimum of 10 percent representation of vegetation conditions that are referred to as Range of Natural Variability. This means that, for each Landscape Ecosystem, at least 10 percent of each vegetative growth stage (the combination of species and ages of trees) would be in the range of natural variability.

> ***Range of Natural Variability*** is the variation of physical and biological conditions within an area due to natural processes with all of the elements present and functioning.

## 2.3.4 Management Areas

Management areas (MAs) provide direction in terms of the types of human uses allowed in specific areas of the Forests. Different management areas emphasize different kinds of uses. The mix of management areas changes between alternatives depending on the theme of the alternative.

> ***Management Areas*** (management direction for a specific location) are the social information used in planning, such as what human uses are emphasized.

Some of the MAs in the Proposed Forest Plans have not changed from the MAs in the 1986 Plans. Others differ spatially and numerically from the current MAs.

The management direction for the following MAs generally have not changed from the 1986 Plans:

- Pristine Wilderness

- Primitive Wilderness
- Semi-primitive Non-motorized Wilderness
- Semi-primitive Motorized Wilderness
- Potential Candidate Wild, Scenic, and Recreational Rivers
- Experimental Forest
- Research Natural Areas
- Unique Areas

The following is a brief description of each MA. Each MA has a different mix of resource uses. The descriptions here only highlight the predominant use in the MA and do list the multiple uses of each MA. The emphasis in each area is not an exclusive use.

## General Forest Emphasis

There are two management areas with a general forest emphasis: General Forest MA and Longer Rotation Emphasis MA. The amount of land in the general forest areas is plentiful in most alternatives because it includes the broadest variety of uses. These areas are managed to maintain ecosystem integrity while providing a variety of sustainable economic and social uses and values. Management emphasizes maintaining a variety of vegetative communities, age classes, and habitats that are appropriate within landscape ecosystems. These areas are also managed for forest products, and occasionally there is a moderate to high level of human interaction on the landscape.

Timber management is one of the primary activities in these MAs. When trees are harvested, they provide commercial pulpwood, sawtimber, and fiber at sustainable levels. Other forest products are also available, such as firewood and boughs. Items that are traditionally gathered, including birch bark and pinecones, are available within these MAs.

Other activities, such as recreation, are also featured in these two MAs. A wide variety of recreation opportunities is provided. Examples include hunting, recreation motor vehicle use, hiking, camping, and water-based recreation. Roads and developed recreation facilities are present, such as campgrounds and trails. Higher maintenance level roads that are developed for forest management activities would likely stay open for public use.

Recreational activities occur in natural-appearing forest surroundings that are modified by forest management activities. The visual effects of timber management are often noticeable and may sometimes dominate the landscape. The landscape is diverse with a combination of continuous canopy, open canopy, and areas of young regenerating forest. Openings are shaped to follow natural landforms or features, with sizes typically ranging from 10 to 100 acres and occasionally up to 1,000 acres.

### General Forest MA

The range of rotation ages for each forest type is determined by specific objectives for landscape ecosystems that are outlined in Chapter 3 of the Draft Proposed Forest Plans. In the General Forest MA, timber harvest occurs at all rotation ages within the range set by the landscape ecosystem objectives.

Forest vegetation communities are managed with practices that mimic ecosystem processes, mainly mimicking stand replacement disturbance. A full range of silvicultural practices is used. However, compared to the Longer Rotation Emphasis MA, there is more clearcutting.

Management activities generally create young, even-aged forests. A mosaic of young to mature (1 to 150 years) trees dominates these areas. Compared to other MAs, this MA would have the most young forest and the largest sized timber harvest units.

Management-ignited fire is used primarily to prepare sites for regenerating new forests and to reduce woody fuel that could cause wildfires.

### Longer Rotation Emphasis MA

In the Longer Rotation Emphasis MA, final harvest occurs more often at extended rotation ages than at minimum rotation ages for some forest types. The range of rotation ages for each forest type is determined by the management objectives for each landscape ecosystem (see Chapter 3 of the Draft Proposed Forest Plans).

Forest vegetation communities are managed with practices that mimic both stand replacement disturbance and less severe stand maintenance disturbance. A full range of silvicultural practices is employed. However, compared to the General Forest MA, there is more partial cutting. When clearcutting

is used in the Longer Rotation Emphasis MA, it would generally be at an extended rotation age.

Management activities leave both young, even-aged and older, multi-aged forests on the landscape. A mosaic of young to old (1 to 250 years) trees dominates these areas.

Management-ignited fire is used to mimic natural disturbances on the landscape to maintain vegetation communities. Fire is also used as a tool to prepare sites for regenerating new forests and to reduce woody fuel that could cause wildfires.

Compared to the General Forest MA, forest management activities in the Longer Rotation Emphasis MA would generally be less noticeable to visitors.

## Recreation and Scenic Emphasis

Two management areas emphasize recreation and scenic resources:

- Recreation Use in a Scenic Landscape MA
- Potential Candidate Wild, Scenic, and Recreational River MA

Ecosystems are managed to provide a predominantly natural-appearing landscape that may be slightly modified by forest management activities. These areas emphasize a large tree and old forest character. Management activities, such as road construction, enhance recreation and aesthetic objectives, such as vistas, and may be noticeable to visitors. Timber harvest, management-ignited fire, tree planting, and other management techniques may be used to meet recreation and scenic resource objectives.

### Recreation Use in a Scenic Landscape MA

Concentrated recreation use is emphasized in these areas. Facilities and access may be highly developed, resulting in a high degree of user interaction. There may be paved roads and buildings. These areas provide many recreational facilities, including day use areas, resorts, visitor centers, trails, and camping at developed campgrounds.

Low- to high-density recreation occurs in these large geographic areas. Viewsheds are managed for scenic beauty and big-tree character. Generally, these areas offer a natural-appearing forest setting with some facility and trail development and roads for recreation. These areas also provide wildlife habitat to enhance opportunities for watching wildlife.

### Potential Candidate Wild, Scenic, and Recreational Rivers MA

These areas provide for the interim protection of river corridors identified as Wild, Scenic, or Recreational River candidates. Under the interim protection, management works toward maintaining the outstanding values of the river corridors. Areas are managed as a range of settings from primitive to developed recreation areas, depending on the potential river designation.

## Semi-primitive Recreation Emphasis

Three management areas emphasize semi-primitive recreation:

- Semi-primitive Non-motorized Recreation MA
- Semi-primitive Motorized Recreation MA
- Semi-primitive Motorized and Non-motorized Recreation MA

These areas provide opportunities for low-density, undeveloped recreation. Examples include: walking, hiking, cross-country skiing, snowshoeing, trail running, canoeing, fishing, and horseback riding. The motorized areas also provide trail-riding opportunities for recreation motor vehicle (RMV) use.

Recreational activities occur in natural-appearing environments that may be slightly modified by forest management activities. Interaction among recreational users is low, but there is some evidence of other users.

Management activities in these areas enhance recreation and aesthetic objectives and may be occasionally noticeable to visitors. These management activities may include developing primitive campsites, harvesting timber, using management-ignited fire, and planting trees.

Ecosystems are managed to provide a predominantly natural-appearing landscape, generally emphasizing large trees and older forest with a continuous forest canopy.

### Semi-primitive Motorized Recreation MA

This MA emphasizes land and resource conditions that provide recreational opportunities in nearly primitive surroundings where motorized use is allowed. Motorized use on designated trails is permitted. Recreation motor vehicle use on trails and roads is designated for each kind of vehicle, such as snowmobiles and all-terrain vehicles.

### Semi-primitive Non-motorized Recreation MA

This MA emphasizes land and resource conditions that provide recreational opportunities in nearly primitive surroundings where motorized use is not allowed. Few low standard roads for timber management would be present.

### Semi-primitive Motorized and Non-motorized Recreation MA

This MA would occur on the Chippewa National Forest in Alternative D. These areas provide recreational opportunities for either motorized or non-motorized travel. Timber harvest is used to return and maintain areas to their native cover. Roads are low standard and some are available for RMV use.

## Conservation and Special Features Emphasis

Four management areas emphasize conservation and special features:

- Unique Biological, Geological, or Historical Areas MA
- Special Management Complexes MA
- Minimum Management Natural Areas MA
- Riparian Emphasis Areas MA

Management in these areas focuses on conserving special social or ecological features of the Forests. Management is generally limited but sometimes evident. Timber harvest and other activities may be allowed if needed to achieve the objectives of the area. Recreation and access opportunities, values, and benefits are different in each MA. Recreation activities occur in a range of surroundings from a natural-appearing forest setting with minimal development and human modification to highly developed recreation settings.

### Unique Biological, Geological, or Historical Areas MA

Unique biological, geological, or historical areas are preserved, including a National Natural Landmark on the Superior National Forest. In some areas, the focus is on interpreting features. Timber production is incidental to the primary objective. Recreation facilities are provided only when needed to interpret or protect the resource. Dispersed recreation occurs but may be discouraged.

### Special Management Complexes MA

These areas provide for large areas of contiguous, older forests. Terrestrial and riparian ecosystems are shaped by naturally occurring ecological processes or management actions that mimic those processes. Management activities, such as tree planting and timber harvesting, may be used to maintain, enhance, or restore species composition and forest structure. Dispersed recreation activities generally occur in semi-primitive settings. Some areas may have existing developed campgrounds and trails.

### Minimum Management Natural Areas MA

Natural processes shape terrestrial and riparian ecosystems, and fire is the main management tool. Road networks are substantially reduced compared to the current road density. Recreation activities occur in semi-primitive settings. This MA only applies to Alternative D.

### Riparian Emphasis Areas MA

This MA emphasizes riparian values and functions. Riparian resources are restored, protected, and enhanced in areas where ecosystem processes are sensitive to degradation. Dispersed recreation activities occur in semi-primitive settings. There may also be highly developed campgrounds and trails in natural-appearing surroundings that are somewhat modified by forest management activities.

## Research Emphasis

Three management areas emphasize research:

- Experimental Forests MA
- Research Natural Areas MA (existing)
- Potential Research Natural Areas MA.

### Experimental Forests MA

These areas are formally designated as Experimental Forests. The focus is on researching vegetation

management techniques. Timber products are incidental to the primary objective. Generally, no developed recreation facilities will be provided. Dispersed recreation use occurs but is generally discouraged.

### Research Natural Areas MA

These areas are the existing formally designated Research Natural Areas (RNA). The focus is on preserving and maintaining areas for ecological research, observation, genetic conservation, monitoring, and educational activities. RNAs are not managed for timber products, and harvesting is not allowed. No recreation facilities are provided. Dispersed recreation use occurs but is generally discouraged.

### Potential Research Natural Areas MA

These areas are recommended to be Research Natural Areas. They will be managed similarly to Research Natural Areas until they are formally designated as Research Natural Areas.

## Wilderness Emphasis

Four management areas emphasize wilderness:

- Pristine Wilderness MA
- Primitive Wilderness MA
- Semi-primitive Non-motorized Wilderness MA
- Semi-primitive Motorized Wilderness MA
- Recommended Wilderness MA

Wilderness MAs are federally designated wilderness or areas that may be recommended for wilderness designations.

Ecosystems are managed to allow ecological processes such as fire, insects, and disease to operate relatively free from human influence. Diverse landscapes result from naturally occurring succession and natural disturbance. Vegetation is managed only to protect wilderness values or to protect adjacent property from fire or pests.

### Pristine Wilderness MA

These areas are non-motorized where activities of contemporary humans are not noticeable. Trails, portages, and campsites are not constructed or maintained. Visitors rarely encounter each other.

### Primitive Wilderness MA

These areas are non-motorized and away from main travel routes, but activities of contemporary humans are somewhat noticeable. Campsites have latrines and firegrates. Portages and trails are maintained. Visitors infrequently encounter each other.

### Semi-primitive Non-motorized Wilderness MA

Campsites have latrines and firegrates. Portages and trails are constructed and maintained but are on main travel routes. Visitors encounter each other with moderate frequency.

### Semi-primitive Motorized Wilderness MA

Based on the BWCA Act, these are the only places where motorized watercraft are permitted in wilderness. Campsites have latrines and firegrates. Portages and trails are constructed and maintained and are along main travel routes. The frequency of encounters with others is moderate to high.

### Recommended Wilderness MA

These areas are recommended as additions to the National Wilderness Preservation System. Recommended Wilderness areas would be managed in a way that would allow them to retain their eligibility as wilderness. They would be semi-primitive non-motorized areas, so there would be minimal encounters with others, minimal evidence of human activities, and minimal facilities provided for visitors.

## Minimum Investment Emphasis

There is one management area that emphasizes minimum investment, the Minimum Investment Emphasis MA. These are areas where NFS land is sparse and where Forest Service management and investment are minimal. These areas may be a priority for a land exchange for other ownership. Ecosystems are managed for protecting and maintaining environmental values and protecting public health and safety. This MA only applies to Alternative A on the Superior NF.

# 2.4 ALTERNATIVES CONSIDERED IN DETAIL

The follow narrative and tables provide brief descriptions of the alternatives that were considered in the analysis. The way management areas are layered on top of landscape ecosystems varies by alternative. Management areas were distributed in each alternative to reflect the theme of the alternative. Therefore, the land area of the Forests is allocated to management areas differently in each alternative as evidenced by the acreage allocations in the tables on the following pages.

The seven alternatives considered in detail provide for a range of outcomes, outputs and environmental effects. They were developed in order to demonstrate differing ways of responding to issues and resource emphases. The social, economic and ecological effects also vary by alternative. Most, but not all of the effects analyzed have been mitigated through the use of standards or guidelines. The effects of the alternatives described in the Environmental Consequences section of the Draft EIS could be further reduced during project implementation by the use of site-specific mitigations. However, for the purpose of demonstrating differences between alternatives considered in detail, the analysis in the Draft EIS does not include all of these mitigations. Doing so would tend to make alternatives appear much more alike and alter the overall themes the alternatives were originally designed to accomplish.

Management in the Boundary Waters Canoe Area Wilderness will not change under any of the alternatives. Natural resource managers will use both management area direction and knowledge of landscape ecosystems to develop site-level prescriptions that move the Forests toward the desired conditions.

### Preferred Alternative

Alternative E is the Preferred Alternative proposed in the Draft Forest Plan revision for the Chippewa and Superior NFs. This alternative is described in detail in section 2.4.5 and includes the elements common to all alternatives described in section 2.3. In the Proposed Forest Plans for the Chippewa and Superior NFs, the desired management emphasis for each Management Area and Landscape Ecosystem is described for the preferred alternative

## 2.4.1 Alternative A

Alternative A is the 'no action' alternative. In forest plan revision, 'no action' means that guidance for the next ten years would generally be the same as the management direction in the amended current Forest Plans. Alternative A emphasizes managing the forests to provide timber as well as deer and moose habitat, and developed and undeveloped recreational opportunities in motorized and non-motorized settings. This alternative would maintain the existing higher standards roads while decommissioning some of the existing low standard roads. New low standard roads would also be constructed.

**Table 2.4.1. Distribution of Management Areas in Alternative A**

| Management Area | Chippewa NF | Superior NF |
|---|---|---|
| | Total MA (acres) | Total MA (acres) |
| General Forest Emphasis | | |
| General Forest Emphasis | 621,899 | 1,160,990 |
| Longer Rotation Emphasis | 0 | 0 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 3025 | 114,331 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 28,457 |
| Semi-primitive Recreation Emphasis | | |
| Semi-primitive Motorized Recreation | 0 | 39,072 |
| Semi-primitive Non-motorized Recreation | 12,365 | 0 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 0 | 0 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 0 | 0 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 769 | 0 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,872 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,644 |
| Semi-primitive Motorized Wilderness | 0 | 70,569 |
| Recommended Wilderness | 0 | 0 |
| Minimum Investment Emphasis | | |
| Minimum Investment | 0 | 47,420 |
| **Total*** | 658,024 | 2,208,413 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.
* Totals do not exactly match among alternatives due to rounding.

## 2.4.2 Alternative B

Alternative B emphasizes restoring older, mixed forests and coniferous species. Protecting unique resources is emphasized more in this alternative than in other alternatives. Timber management and other commercial resource management would be secondary to increasing the amount of older forest. This alternative would maintain the existing higher standards roads while decommissioning some of the existing low standard roads. Some new low standard roads would also be constructed. Developed and undeveloped recreational opportunities in a scenic landscape would be emphasized.

**Table 2.4.2. Distribution of Management Areas in Alternative B**

| Management Area | Chippewa NF | Superior NF |
|---|---|---|
| | Total MA (acres) | Total MA (acres) |
| General Forest Emphasis | | |
| General Forest Emphasis | 0 | 0 |
| Longer Rotation Emphasis | 401,236 | 618,997 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 4,646 | 74,637 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 18,888 |
| Semi-primitive Recreation Emphasis | | |
| Semi-primitive Motorized Recreation | 0 | 0 |
| Semi-primitive Non-motorized Recreation | 14,662 | 261,863 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 169,098 | 354,751 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 36,108 | 0 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 6,077 | 43,698 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,872 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,631 |
| Semi-primitive Motorized Wilderness | 0 | 70,540 |
| Recommended Wilderness | 6,213 | 17,481 |
| Minimum Investment Emphasis | | |
| Minimum Investment | NA | 0 |
| **Total*** | 658,006 | 2,208,415 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.
* Totals do not exactly match among alternatives due to rounding.

## 2.4.3 Alternative C

Alternative C emphasizes producing timber and replicating large-scale natural disturbances, such as large fires or large blowdowns. Timber harvest would be the main tool used to create large-scale disturbance. To provide for older trees and wildlife habitat, extended rotations would be used in some situations. Under Alternative C, there would be more large patches of young forest than in Alternative A. This alternative would maintain the existing higher standards roads while decommissioning some of the existing low standard roads. New low standard roads would also be constructed. Developed and undeveloped recreational opportunities in motorized and non-motorized settings would be provided.

**Table 2.4.3. Distribution of Management Areas in Alternative C**

| Management Area | Chippewa NF | Superior NF |
|---|---|---|
| | Total MA (acres) | Total MA (acres) |
| General Forest Emphasis | | |
| General Forest Emphasis | 569,275 | 1,155,938 |
| Longer Rotation Emphasis | 39,548 | 52,173 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 1,800 | 113,877 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 28,458 |
| Semi-primitive Recreation Emphasis | | |
| Semi-primitive Motorized Recreation | 0 | 39,071 |
| Semi-primitive Non-motorized Recreation | 12,364 | 0 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 0 | 0 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 14,287 | 0 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 769 | 776 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,373 |
| Primitive Wilderness | 0 | 301,872 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,620 |
| Semi-primitive Motorized Wilderness | 0 | 70,569 |
| Recommended Wilderness | 0 | 0 |
| Minimum Investment Emphasis | | |
| Minimum Investment | NA | 0 |
| **Total*** | 658,009 | 2,208,413 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.

* Totals do not exactly match among alternatives due to rounding.

## 2.4.4 Alternative D

Alternative D emphasizes semi-primitive, non-motorized recreation, and restoring conifers to create an 'old-tree' character. The highest priority for vegetative restoration would be establishing white pine. Vegetation management would transition away from timber production toward ecological succession and some restoration. However, timber harvesting would be used in the first two decades as a tool to restore some cover types. After this 20-year period, a very low level of timber harvest would be used to maintain a representation of all forest types and ages. The clearcutting harvest method would generally not be used in this alternative. This alternative would maintain most, but not all of the existing higher standards roads while decommissioning many of the existing low standard roads. Very few to no new low standard roads would be constructed. Developed and undeveloped recreational opportunities in a scenic landscape would be emphasized.

**Table 2.4.4. Distribution of Management Areas in Alternative D**

| Management Area | Chippewa NF Total MA (acres) | Superior NF Total MA (acres) |
|---|---|---|
| General Forest Emphasis | | |
| General Forest Emphasis | 0 | 0 |
| Longer Rotation Emphasis | 0 | 0 |
| Recreation and Scenic Emphasis | | 0 |
| Recreation Use in a Scenic Landscape | 11,351 | 569,770 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 18,278 |
| Semi-primitive Recreation Emphasis | | 0 |
| Semi-primitive Motorized Recreation | 0 | 0 |
| Semi-primitive Non-motorized Recreation | 70,536 | 86,957 |
| Semi-primitive Non-motorized & Motorized Recreation | 221,140 | 0 |
| Conservation and Rare Features Emphasis | | 0 |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 0 | 0 |
| Minimum Management Natural Areas | 323,257 | 615,762 |
| Riparian Emphasis Areas | 0 | 0 |
| Research Emphasis | | 0 |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 5,542 | 39,042 |
| Wilderness Emphasis | | 0 |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,859 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,628 |
| Semi-primitive Motorized Wilderness | 0 | 70,532 |
| Recommended Wilderness | 6,213 | 60,534 |
| Minimum Investment Emphasis | | 0 |
| Minimum Investment | NA | 0 |
| **Total*** | 658,006 | 2,208,420 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.

* Totals do not exactly match among alternatives due to rounding.

## 2.4.5 Alternative E

Alternative E emphasizes diverse economic opportunities for local communities. Compared to the other alternatives, the Forests would be managed in a way that provides a variety of economic opportunities. This alternative focuses more on tourism and its associated revenues by emphasizing resources such as recreational opportunities, scenic landscapes, and diverse wildlife habitats. Alternative E would provide a broad range of recreation opportunities in motorized and non-motorized settings. Timber and other commodity products would also be emphasized. There would be a focus on protecting, enhancing, and restoring riparian areas because they are important to recreation and tourism. Alternative E emphasizes timber harvesting less than Alternatives C and A but more than the other alternatives. Existing higher standards roads would be maintained. Some existing low standard roads would be decommissioned. New low standard roads would also be constructed.

**Table 2.4.5. Distribution of Management Areas in Alternative E**

| Management Area | Chippewa NF | Superior NF |
|---|---|---|
| | Total MA (acres) | Total MA (acres) |
| General Forest Emphasis | | |
| General Forest Emphasis | 353,925 | 651,931 |
| Longer Rotation Emphasis | 198,916 | 366,037 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 7,790 | 235,548 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 27,478 |
| Semi-primitive Recreation Emphasis | | 0 |
| Semi-primitive Motorized Recreation | 0 | 69,152 |
| Semi-primitive Non-motorized Recreation | 12,364 | 3,493 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 0 | 0 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 61,094 | 18,446 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 3,951 | 18,217 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,870 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,619 |
| Semi-primitive Motorized Wilderness | 0 | 70,567 |
| Recommended Wilderness | 0 | 0 |
| Minimum Investment Emphasis | | |
| Minimum Investment | NA | 0 |
| **Total*** | 658,006 | 2,208,416 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.

* Totals do not exactly match among alternatives due to rounding.

## 2.4.6 Alternative F

Alternative F emphasizes managing for a vegetative condition within the range of natural variability on National Forest System land. Timber harvest and prescribed fire would be used to mimic natural disturbances. Ecological processes would be maintained or restored by using a variety of timber harvest methods, management-ignited fire, and allowing natural processes to operate. Conifer and northern hardwood forest types would be restored. Areas that historically experienced high-intensity, stand-replacing events, such as wildfires and large-scale blowdowns, would be intensively managed. Areas that experienced low-intensity, stand maintenance events, such as surface fires and minor wind throw, would be less intensively managed. The existing higher standards roads would be maintained. Some existing low standard roads would be decommissioned. New low standard roads would also be constructed. Developed and undeveloped recreational opportunities in motorized and non-motorized settings would be provided.

**Table 2.4.6. Distribution of Management Areas in Alternative F**

| Management Area | Chippewa NF | Superior NF |
|---|---|---|
| | Total MA (acres) | Total MA (acres) |
| General Forest Emphasis | | |
| General Forest Emphasis | 11,995 | 318,983 |
| Longer Rotation Emphasis | 553,236 | 856,220 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 1,800 | 110,500 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 27,371 |
| Semi-primitive Recreation Emphasis | | |
| Semi-primitive Motorized Recreation | 0 | 32,842 |
| Semi-primitive Non-motorized Recreation | 11,816 | 0 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 36,408 | 514 |
| Special Management Complexes | 0 | 0 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 21,629 | 0 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 9,261 | 44,378 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,872 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,624 |
| Semi-primitive Motorized Wilderness | 0 | 70,569 |
| Recommended Wilderness | | 0 |
| Minimum Investment Emphasis | 0 | |
| Minimum Investment | N/A | 0 |
| **Total*** | 658,006 | 2,208,417 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.

* Totals do not exactly match among alternatives due to rounding.

## 2.4.7 Alternative G

Alternative G emphasizes managing vegetation communities in a way that distributes young forest, older forest, and old growth across the Forests. Under Alternative G, the Forests would be delineated as young, mature, or old-growth forests. Timber harvest and prescribed fire would be used to mimic natural disturbances. Ecological processes would be maintained or restored by using a variety of timber harvest methods, management-ignited fire, and allowing natural processes to operate. Conifer and northern hardwood forest types would be restored. The existing higher standards roads would be maintained. Some existing low standard roads would be decommissioned. New low standard roads would also be constructed. Developed and undeveloped recreational opportunities in motorized and non-motorized settings would be provided.

**Table 2.4.7. Distribution of Management Areas in Alternative G**

| Management Area | Chippewa NF Total MA (acres) | Superior NF Total MA (acres) |
|---|---|---|
| General Forest Emphasis | | |
| General Forest Emphasis | 153,978 | 419,515 |
| Longer Rotation Emphasis | 326,159 | 609,974 |
| Recreation and Scenic Emphasis | | |
| Recreation Use in a Scenic Landscape | 1,802 | 87,406 |
| Potential Candidate Wild, Scenic, and Recreational Rivers‡ | 1,537 | 21,650 |
| Semi-primitive Recreation Emphasis | | |
| Semi-primitive Motorized Recreation | 5,140 | 29,670 |
| Semi-primitive Non-motorized Recreation | 18,100 | 1,647 |
| Semi-primitive Non-motorized & Motorized Recreation | 0 | 0 |
| Conservation and Rare Features Emphasis | | |
| Unique Biological, Aquatic, Geological, or Historical Areas | 8,105 | 514 |
| Special Management Complexes | 85,621 | 183,302 |
| Minimum Management Natural Areas | 0 | 0 |
| Riparian Emphasis Areas | 35,498 | 0 |
| Research Emphasis | | |
| Experimental Forest | 8,184 | 0 |
| Research Natural Areas (existing) | 2,140 | 3,172 |
| Potential Research Natural Areas | 9,015 | 33,580 |
| Wilderness Emphasis | | |
| Pristine Wilderness | 0 | 115,372 |
| Primitive Wilderness | 0 | 301,859 |
| Semi-primitive Non-motorized Wilderness | 0 | 326,515 |
| Semi-primitive Motorized Wilderness | 0 | 70,569 |
| Recommended Wilderness | 2,727 | 3,672 |
| Minimum Investment Emphasis | | |
| Minimum Investment | 0 | 0 |
| **Total*** | 658,006 | 2,167,455 |

‡ Acres of Potential Candidate Wild and Scenic River corridors protected is the same in every alternative (29,994 acres). However, some corridors were assigned to management areas that are more protective than the Potential Candidate Wild, Scenic, and Recreational Rivers MA, such as recommended wilderness or potential RNA MA.
* Totals do not exactly match among alternatives due to rounding.

# 2.5 SUMMARY OF ESTIMATED VEGETATIVE TREATMENT OUTCOMES AND ACTIVITIES

## 2.5.1 Chippewa National Forest

**Table 2.5.1. Summary of Estimated Vegetative Treatment Outcomes and Activities by Alternative for the Chippewa NF**

| Outcome or Activity | | Unit | Time-frame | Alternative | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A No Action | B | C | D | E | F | G |
| Suitable Timber Land | | Acres | NA | 471,365 | 456,399 | 471,365 | 0 | 461,013 | 444,360 | 456,933 |
| Total Area Harvested | | Maximum acres | 1st ten years of implementation | 85,340 | 55,141 | 117,828 | 34,752 | 62,250 | 47,288 | 60,652 |
| Clearcutting Proportion* | | Percent of total acres treated | 1st ten years of implementation | 70% | 30% | 65% | 0% | 59% | 50% | 39% |
| Timber Volume (average '92-'02 = 65 MMBF) | | Maximum MMBF | 1st ten years of implementation | 70 | 38 | 91 | 21 | 50 | 37 | 46 |
| Site Preparation (mechanical & prescribed fire) | | Maximum acres | 1st ten years of implementation | 61,064 | 16,720 | 88,414 | 0 | 37,141 | 23,604 | 23,696 |
| Prescribed Fire for Ecosystem Disturbance in the 1st ten years | | Acres of red and white pine over 40 yrs old and not scheduled for harvest | 1st ten years of implementation | 6,666 | 21,829 | 6,666 | 59,487 | 7,373 | 8,016 | 8,606 |
| Prescribed Fire for Hazardous Fuel Reduction | | Max acres that could be treated | 1st ten years of implementation | 31,091 | 54,706 | 33,900 | 114,542 | 41,959 | 49,587 | 41,929 |
| Present Net Value (full implementation)** | w/market values | Millions of dollars | 100 yrs at 4% | -420 | -524 | -438 | -600 | -480 | -520 | -500 |
| | w/market and non-market values | | | 10,895 | 10,770 | 10,946 | 10,696 | 10,871 | 10,761 | 10,790 |

* % shown are for clearcutting – other harvest methods including uneven-aged and even aged treatments account for the remainder
* * *Present net value* is calculated by subtracting discounted costs from discounted benefits (or revenues). It is a measure of how efficiently the Forest Service is using tax dollars to obtain the goals of each alternative. *Market values* are products and services that the Forests Service provides that have an established price, such as timber, campground fees, and special use fees. *Non-market values* are estimated "prices" for items that do not have an established price, such as recreation visitor days for snowmobiling, hiking, or hunting.

## 2.5.2 Superior National Forest

**Table 2.5.2. Summary of Estimated Vegetation Treatment Outcomes and Activities by Alternative for the Superior NF**

| Outcome or Activity | | Units | Time-frame | Alternative | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A No Action | B | C | D | E | F | G |
| Suitable Timber Land acres | | Acres | NA | 981,908 | 884,727 | 991,954 | 0 | 956,504 | 959,428 | 944,024 |
| Total Area Harvested | | Maximum acres | 1st ten years of implementation | 156,202 | 88,292 | 221,191 | 76,099 | 130,091 | 107,365 | 116,763 |
| Clearcutting Proportion* | | Percent of total acres treated | 1st ten years of implementation | 73% | 42% | 74% | 0% | 71% | 61% | 52% |
| Timber Volume (average '92-'02 = 75 MMBF) | | Maximum MMBF | 1st ten years of implementation | 100 | 51 | 150 | 37 | 82 | 70 | 70 |
| Site Preparation (mechanical & prescribed fire) | | Maximum acres | 1st ten years of implementation | 114,238 | 36,946 | 164,208 | 0 | 92,807 | 66,233 | 61,295 |
| Prescribed Fire for Ecosystem Disturbance | | Acres of red and white pine over 40 yrs old and not scheduled for harvest | 1st ten years of implementation | 7,437 | 22,730 | 7,437 | 61,321 | 9,532 | 9,968 | 10,714 |
| Prescribed Fire for Hazardous Fuel Reduction | | Maximum acres that could be treated | 1st ten years of implementation | 99,848 | 191,380 | 119,214 | 216,384 | 139,771 | 168,350 | 153,825 |
| Present Net Value (full implementation)** | w/market values | Millions of dollars | 100 yrs at 4% | -1,131 | -1,258 | -1,153 | -1,362 | -1,226 | -1,245 | -1,226 |
| | w/market and non-market values | Millions of dollars | 100 yrs at 4% | 5,667 | 5,583 | 5,663 | 5,482 | 5,608 | 5,542 | 5,587 |

* % shown are for clearcutting – other harvest methods including uneven-aged and even aged treatments account for the remainder

** *Present net value* is calculated by subtracting discounted costs from discounted benefits (or revenues). It is a measure of how efficiently the Forest Service is using tax dollars to obtain the goals of each alternative. *Market values* are products and services that the Forests Service provides that have an established price, such as timber, campground fees, and special use fees. *Non-market values* are estimated "prices" for items that do not have an established price, such as recreation visitor days for snowmobiling, hiking, or hunting.

# Chapter 3 Affected Environment and Environmental Consequences

## 3.1 INTRODUCTION

Chapter 3 discloses the analysis of environmental effects that are expected to occur as an outcome of implementing each alternative described in Chapter 2. Environmental effects are measured in terms of "indicators" relative to issues described in Chapter 1. The following discussion is a summary of effects described in the Draft EIS. It is important to understand that "existing condition" refers to current status while "current Forest Plan" refers to the management direction in the 1986 Forest Plans as represented by Alternative A.

## 3.2 FOREST VEGETATION

Two key pieces of information used for the Forest Plan revision effects analysis of proposed management direction involve the application of landscape ecosystems as a geographic unit and the concept of Range of Natural Variability to compare outcomes under the alternatives. Range of natural variability (RNV) refers to the expected variation in physical and biological conditions caused by natural variations in climate and disturbances, such as wildfire and windstorms

### 3.2.1 Forest Composition and Structure

All of the proposed alternatives include some amount of tree harvesting, including stand regeneration harvesting. Harvest levels vary from relatively small amounts of harvesting in Alternative D to relatively large amounts of harvesting in Alternative C. Tree harvesting has implications for all measurements used to analyze the alternatives for effects to forest vegetation. These effects vary by the type and amount of tree harvesting method. The types and amounts of these methods vary by alternative according to the theme of each alternative.

Forest succession (the sequential change in forest composition and structure of a particular stand as it ages or as it is subjected to local natural disturbances) is also common to all alternatives. How this process plays out across the landscape at a national forest level is dependent on vegetation objectives, the proposed and probable harvest cutting methods used, the amount and types of prescribed fire used, and natural disturbances. The vegetation objectives, amounts and types of tree harvesting methods, and amount of prescribed fire to be used varies according to the management direction for the alternatives.

#### Amounts of Forest Types Compared to the Range of Natural Variability Values

When compared to historic vegetation conditions that occurred within the range of natural variability (RNV), the current amount of aspen forest type on National Forest land is two to three times more than would have occurred under RNV. Conversely, when compared to RNV, the current amounts of jack pine, white pine, spruce-fir, and northern hardwood (Chippewa NF only) are under-represented.

Alternatives A, and C generally tend to maintain current amounts of forest types, while Alternatives B, F, G, and E generally move closer to RNV value amounts over the long term, but in different amounts and at different rates. Alternative D moves vegetation considerably away from the existing amounts, beyond RNV, and tends to over-represent the long-lived forest types (red pine, white pine, spruce-fir, and northern hardwoods).

### Amounts of Forest by Age Class Compared to the Range of Natural Variability Values

When compared to the amounts that occurred within RNV, the current amount on National Forest land in the 0 to 9 and 50 to 99 year age classes are considerably over-represented. Conversely, when compared to RNV, the current amounts in the 100 to 149 and 150 plus year age classes are considerably under-represented.

Alternatives A and C generally tend to maintain the current amounts in the various age classes, while Alternatives B, F, G, and E generally move closer to the RNV value amounts over the long term. Again, Alternative D moves considerably away from the existing amounts, beyond RNV conditions, and tends to over-represent the older age classes.

### Resulting Within-stand Complexity on Treated Stands

Plant species diversity and structural complexity is affected by management treatments. Tree harvest cutting methods such as clearcutting and similar even-aged harvest methods can tend to simplify within-stand complexity while those such as partial harvests, retaining a majority of the overstory trees, and multi-aged/selection harvests tend to increase within-stand complexity. Prescribed fire, when used in fire-dependent landscape ecosystems, also tends to increase within-stand complexity.

Alternatives A, C, and E tend to rely heavily on even-aged harvest cutting methods, especially clearcutting; while Alternatives B and F tend to rely more on partial harvests and uneven-aged harvest methods. Alternatives A, C, E, and G would use less prescribed fire for ecological restoration than Alternatives B, D and G. Alternative D relies completely on partial harvest cutting methods, however it would actively treat a relatively small amount of the total forest.

On the Chippewa NF Alternatives B and G would tend to have more within stand complexity compared to the other alternatives in the first two decades. On the Superior NF Alternatives B, D, and G would tend to have more within stand complexity compared to the other alternatives in the first two decades.

### Projected Amounts of Old-growth Forest Conditions

Old-growth forest conditions can be provided in a variety of ways. Each alternative provides for these conditions differently. Over the long term, Alternatives A, C and E, respectively, tend to provide fewer acres in the later vegetation growth stages that are expected to provide old-growth forest characteristics. They also tend to have fewer acres in special designations that may provide some or all of the appropriate old-growth characteristics over time, and these designations are not necessarily managed for old-growth forest conditions. Alternatives D, B, G, and F, respectively, would provide more acres in the later vegetation growth stages. They also tend to have more acres in special designations, especially those such as potential Research Natural Areas, Special Management Complexes, and Minimum Management Natural Areas, where old-growth forest conditions are expected to occur over the long term.

## 3.2.2 Forest Spatial Patterns

The Chippewa and Superior National Forests are capable of providing for a variety of habitat conditions in the context of vegetative spatial patterns. These spatial patterns refer to the size, shape, and arrangement of forest types, habitats, and vegetation communities resulting from natural disturbances and forest management activities.

At issue is the size and age of forest patches, and quantity of interior habitat. The analysis of spatial patterns focused on broad level descriptors that included the size and amount of large mature and older forest patches; size and amount of large young forest patches; and the amount of forest interior and management induced edge density. A coarse filter approach was used in the analysis for meeting broad ecosystem conditions that can be described in terms of forest age, composition, and spatial patterns.

Inherent features of each Forest, such as land ownership patterns or the size of harvested areas, and the estimation of natural decadal disturbances in the Boundary Waters Canoe Area Wilderness, are understood as constant contributing factors within the Draft EIS analysis.

The cumulative effects in the Draft EIS includes a summary of each alternative's influence on forest spatial patterns. Ownership patterns; current and predicted disturbance rates on forested lands and the relationship to the range of natural variability; recent

forest management trends; and the desired conditions of landscapes help to place into context foreseeable effects to landscape patterns.

In comparison to the existing condition, Alternatives D, B, F, and G would create forest spatial patterns that provide a greater representation of section-wide ecosystem structure, processes, and functions that were once more common within the Chippewa and Superior National Forests. Alternatives A and C would create forest spatial patterns that provide less. On the Chippewa NF Alternative E would create patterns slightly less than the existing condition. On the Superior NF Alternative E would create patterns less than the existing condition but more than Alternatives A and C.

## 3.2.3 Insects and Disease

Since about 1912 in northern Minnesota, eastern spruce budworm has been a concern as a threat to mature spruce/fir forest stands, while shoot blights on two-storied red and jack pine stands have been known to be present since the 1960's. Outbreaks of spruce budworm and shoot blights will kill trees, and in most cases result in the loss of merchantable timber. As trees rot and fall, fuels accumulate. As a result, and depending on the area affected, the hazard of wildfire increases. The larger the area affected, the greater the risk of a catastrophic (larger and hotter) wildfire increases. Budworm and shoot blight epidemics may also alter wildlife habitat, lessen the recreational experience of the general forest user, and reduce the scenic integrity of the forested landscape.

Under all alternatives, the long-term trend in vegetation on both Forests results in an increase in the acres of mature spruce/fir and two-storied red and jack pine stands. Projected acreages of spruce/fir are well above those capable of sustaining spruce budworm outbreaks of epidemic proportions, but it is unknown how many acres of two-storied red and jack pine acres are needed to support an epidemic of shoot blight.

Although all alternatives would increase the number of mature spruce/fir acres, Alternatives A and C, which emphasize early successional and young forests, would result in the least acreage increase. Alternative E and G, which both emphasize a mix of young and old forests, would result in the next fewest acres. Alternative D, emphasizing old forests, and Alternative F, which has all the proposed RNA's and emphasizes RNV, would result in still more acres. Alternative B, which includes all the proposed SMCs and emphasizes older and conifer forests, would have the largest increase in acres of susceptible forest stands.

Alternative A, which does not emphasize two-storied stands, and Alternative D, which does the least amount of harvesting, would result in the least acres of two-storied stands on both Forests. Alternative G, which utilizes harvest methods that emphasize the establishment and maintenance of two-aged and multi aged stands, produces the most acres of two-storied stands on both forests. The other four alternatives fall in between, mainly because of the difference in the amount of acres harvested on each forest and the harvest methods applied.

# 3.3 WILDLIFE

The Chippewa and Superior National Forest's wildlife habitat provides an environment for a host of terrestrial and aquatic animals, plants, fungi and other organisms.

At issue are the differing opinions about how the National Forests should be managed for the full array of rare to common wildlife species and their habitats. The Draft EIS analysis of wildlife species and their habitats focused on impacts to a suite of management indicator habitats and species of management concern. Management indicator habitats were selected to represent the wide array of major environmental communities on the National Forests. Species of management concern were selected because they could serve to indicate management effects on other species or because they were of high public concern for ecological, social or economic reasons. These include:

- Forest type and age habitats
- Forest spatial pattern habitats
- Lake and stream habitats
- Threatened and endangered species
- Regional Forester sensitive species
- Other species of management concern
- Non-native invasive species.

Analysis of potential effects on wildlife was applied at two different scales. The "coarse filter" scale evaluates effects of management of the Alternatives to broad general habitat conditions that represent requirements for a large number of wildlife species. The "fine filter", or species-specific, analysis was used where impacts to wildlife were found to not be adequately addressed by the coarse filter. The analysis projected future conditions likely under the Alternatives and compared these to the current and historical conditions under the estimated range of natural variability. Trade-offs to groups of species within management indicator habitats and effects on representative species were also considered.

## 3.3.1 Forest Type and Age Management Indicator Species

Representative wildlife species of management concern associated with each Management Indicator Habitat are shown below.

**Table 3.1. Management Indicator Habitat Associated Species of Management Concern**

| Management Indicator Habitat | Species |
|---|---|
| **Upland Young Forest** | Deer, ruffed grouse, chestnut-sided warbler, American woodcock |
| **Upland Mature/Old Forest** | Boreal owl (SNF), barred owl, northern goshawk, red-shouldered hawk (CNF) black-throated blue warbler, pileated woodpecker, least flycatcher, blue-spotted salamander, goblin fern |
| **Young Aspen/Birch Forest** | American woodcock, chestnut sided warbler, golden winged warbler (CNF), mourning warbler, deer, ruffed grouse, moose |
| **Mature/Old Aspen/Birch Forest** | Northern goshawk, boreal owl (SNF), pileated woodpecker, yellow-bellied sapsucker, Canada warbler, scarlet tanager |
| **Young Upland Conifer Forest** | Lynx, snowshoe hare |
| **Mature/Old Upland Conifer** | Lynx, bay-breasted warbler, moose, deer, black-backed woodpecker, spruce grouse, boreal chickadee, Blackburnian warbler, pine warbler, |
| **Mature/old Lowland Black spruce-tamarack** | Boreal owl, Connecticut warbler, great gray owl, boreal chickadee, yellow-bellied flycatcher, golden-crowned kinglet, gray jay, northern bog lemming (CNF), spruce grouse, disa alpine butterfly (SNF), small shinleaf (SNF), white adder's mouth (CNF) |

The Draft DEIS analyzed the effects of the alternatives by using management indicator habitat (MIH) as a surrogate measurement for the impacts on the above species of management concern and other wildlife and wildlife habitats. MIHs were selected because they reflect the broad spectrum of major biological

communities and wildlife management issues better than individual species. As surrogates, forest type and age have limitations for encompassing the many environmental features that comprise wildlife habitat, but they provide a practical and efficient approach to addressing the thousands of species that are found on the National Forests. They represent measurable characteristics of preferred habitat conditions or features at landscape and site level.

Alternatives were analyzed over 100 years, providing information on the short and long-term implications of forest management. Tables 3.2 and 3.3 display selected management indicator habitats in acres by each alternative on both Forests in decades two and ten. These MIHs include: young and old upland forest; aspen/birch-dominated forest; upland conifer-dominated forest; and lowland black spruce/tamarack forest.

**Table 3.2. Chippewa National Forest. Forest Type and Age Management Indicator Habitats**
Number and percent acres at Decades 2, 10. Acres are in thousands. Percents represent % of total upland forest and % of total lowland forest on NFS land in Dualplan.

| | | A | | B | | C | | D | | E | | F | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MIH** | **Existing** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** |
| **Upland Forest 455,881 acres** | | | | | | | | | | | | | | | |
| **Young** | 55.5 | 59.9 | 71.6 | 17.2 | 18.2 | 65.8 | 66.8 | 16.9 | 9.9 | 38.1 | 43.3 | 21.5 | 25.5 | 29.9 | 33.6 |
| **Percent** | 12.2 | 13.1 | 15.7 | 3.8 | 4.0 | 14.4 | 14.7 | 3.7 | 2.2 | 8.4 | 9.5 | 4.7 | 5.6 | 6.6 | 7.4 |
| **Mature+** | 226.5 | 143.3 | 128.6 | 238.6 | 350.3 | 128.2 | 162.2 | 233.3 | 395.4 | 199.7 | 247.7 | 231.1 | 325.2 | 214.8 | 291.6 |
| **Percent** | 66.6 | 4.0 | 28.2 | 52.3 | 76.9 | 28.1 | 35.6 | 51.2 | 86.7 | 43.8 | 54.3 | 50.7 | 71.3 | 47.1 | 64.0 |
| **Aspen / Birch Forest 455,881 acres** | | | | | | | | | | | | | | | |
| **Young** | 44.7 | 38.1 | 48.8 | 8.4 | 10.7 | 41.4 | 39.5 | 8.7 | 5.6 | 22.0 | 31.4 | 7.5 | 11.2 | 13.8 | 17.2 |
| **Percent** | 9.8 | 8.4 | 10.7 | 1.8 | 2.3 | 9.1 | 8.7 | 1.9 | 1.2 | 4.8 | 6.9 | 1.7 | 2.5 | 3.0 | 3.8 |
| **Mature+** | 100.0 | 19.9 | 2.1 | 65.9 | 19.9 | 19.0 | 4.4 | 69.5 | 18.0 | 47.7 | 17.2 | 60.0 | 7.1 | 58.7 | 29.2 |
| **Percent** | 21.9 | 4.4 | 0.5 | 14.5 | 4.4 | 4.2 | 1.0 | 15.3 | 3.9 | 10.5 | 3.8 | 13.2 | 1.6 | 12.9 | 6.4 |
| **All Upland Conifer Forest 455,881 acres** | | | | | | | | | | | | | | | |
| **Young** | 9.8 | 19.8 | 21.4 | 8.8 | 7.5 | 18.6 | 17.3 | 8.3 | 4.3 | 15.3 | 11.8 | 13.3 | 13.6 | 15.3 | 15.9 |
| **Percent** | 2.1 | 4.3 | 4.7 | 1.9 | 1.6 | 4.1 | 3.8 | 1.8 | 0.9 | 3.4 | 2.6 | 2.9 | 3.0 | 3.4 | 3.5 |
| **Mature+** | 63.2 | 54.8 | 62.3 | 88.8 | 187.9 | 55.0 | 82.2 | 83.8 | 224.5 | 75.0 | 134.1 | 87.5 | 172.6 | 81.0 | 156.8 |
| **Percent** | 13.9 | 12.0 | 13.7 | 19.5 | 41.2 | 12.1 | 18.0 | 18.4 | 49.3 | 16.4 | 29.4 | 19.2 | 37.9 | 17.8 | 34.4 |
| **Lowland B. Spruce / Fir Forest 62,195 acres** | | | | | | | | | | | | | | | |
| **Young** | 2.6 | 15.8 | 1.9 | 5.2 | 4.5 | 17.7 | 8.9 | | | 8.2 | 5.3 | 7.6 | 5.4 | 6.6 | 3.7 |
| **Percent** | 4.1 | 25.4 | 3.1 | 8.4 | 7.3 | 28.5 | 14.3 | | | 13.1 | 8.6 | 12.2 | 8.6 | 10.6 | 5.9 |
| **Mature+** | 54.6 | 42.1 | 54.3 | 52.6 | 49.8 | 40.2 | 49.5 | 57.9 | 62.2 | 49.7 | 50.8 | 50.3 | 51.4 | 51.3 | 50.5 |
| **Percent** | 87.8 | 67.7 | 87.3 | 84.6 | 80.1 | 64.6 | 79.5 | 93.1 | 100.0 | 79.9 | 81.7 | 80.9 | 82.7 | 82.4 | 81.2 |

**Table 3.3. Superior National Forest. Forest Type and Age Management Indicator Habitats**
Number and percent acres at Decades 2, 10. Acres are in thousands. Percents represent % of total upland forest and % of total lowland forest on NFS land in Dualplan. Includes BWCAW.

| | | A | | B | | C | | D | | E | | F | | G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MIH** | **Existing** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** | **2** | **10** |
| **Upland Forest 1,648,406 acres** | | | | | | | | | | | | | | | |
| **Young** | 239.8 | 138.2 | 152.6 | 55.1 | 66.6 | 150.9 | 146.9 | 53.8 | 31.6 | 114.8 | 121.8 | 89.0 | 99.5 | 95.2 | 106.4 |
| **Percent** | 14.5 | 8.4 | 9.3 | 3.3 | 4.0 | 9.2 | 8.9 | 3.3 | 1.9 | 7.0 | 7.4 | 5.4 | 6.0 | 5.8 | 6.5 |
| **Mature+** | 860.2 | 718.3 | 874.1 | 879.8 | 1233.2 | 658.8 | 885.6 | 864.2 | 1339.1 | 764.1 | 1007.3 | 826.1 | 1118.6 | 806.8 | 1073.2 |
| **Percent** | 52.2 | 43.6 | 53.0 | 53.4 | 74.8 | 40.0 | 53.7 | 52.4 | 81.2 | 46.4 | 61.1 | 50.1 | 67.9 | 48.9 | 65.1 |
| **Aspen / Birch Forest 1,648,406 acres** | | | | | | | | | | | | | | | |
| **Young** | 75.8 | 111.8 | 97.6 | 39.3 | 40.6 | 103.8 | 89.4 | 23.2 | 7.3 | 87.3 | 76.2 | 59.2 | 60.3 | 69.2 | 63.8 |
| **Percent** | 4.6 | 6.8 | 5.9 | 2.4 | 2.5 | 6.3 | 5.4 | 1.4 | 0.4 | 5.3 | 4.6 | 3.6 | 3.7 | 4.2 | 3.9 |
| **Mature+** | 533.6 | 335.3 | 123.3 | 477.4 | 163.6 | 306.5 | 127.1 | 419.7 | 218.0 | 383.8 | 158.9 | 445.0 | 157.8 | 420.3 | 173.6 |
| **Percent** | 32.4 | 20.3 | 7.5 | 29.0 | 9.9 | 18.6 | 7.7 | 25.5 | 13.2 | 23.3 | 9.6 | 27.0 | 9.6 | 25.5 | 10.5 |
| **All Upland Conifer Forest 1,648,406 acres** | | | | | | | | | | | | | | | |
| **Young acres** | 163.7 | 25.5 | 54.7 | 15.8 | 26.0 | 44.9 | 57.3 | 29.5 | 24.3 | 26.5 | 45.0 | 29.2 | 38.3 | 27.3 | 42.1 |
| **Percent** | 9.9 | 1.5 | 3.3 | 1.0 | 1.6 | 2.7 | 3.5 | 1.8 | 1.5 | 1.6 | 2.7 | 1.8 | 2.3 | 1.7 | 2.6 |
| **Mature+** | 490.0 | 530.6 | 825.0 | 548.2 | 1136.1 | 522.9 | 832.0 | 569.3 | 1184.9 | 528.1 | 920.4 | 528.6 | 1030.6 | 550.0 | 971.6 |
| **Percent** | 29.7 | 32.2 | 50.0 | 33.3 | 68.9 | 31.7 | 50.5 | 34.5 | 71.9 | 32.0 | 55.8 | 32.1 | 62.5 | 33.4 | 58.9 |
| **Lowland B. Spruce / Fir Forest 283,051 acres** | | | | | | | | | | | | | | | |
| **Young** | 13.9 | 25.9 | 4.7 | 14.7 | 11.6 | 62.7 | 15.1 | 1.4 | 1.4 | 20.7 | 18.3 | 17.0 | 16.1 | 11.6 | 12.4 |
| **Percent** | 4.9 | 9.1 | 1.7 | 5.2 | 4.1 | 22.1 | 5.3 | 0.5 | 0.5 | 7.3 | 6.5 | 6.0 | 5.7 | 4.1 | 4.4 |
| **Mature+** | 224.9 | 218.5 | 246.3 | 229.7 | 227.2 | 181.7 | 236.6 | 242.9 | 262.6 | 223.7 | 212.3 | 227.3 | 217.5 | 232.7 | 231.2 |
| **Percent** | 79.4 | 77.2 | 87.0 | 81.1 | 80.3 | 64.2 | 83.6 | 85.8 | 92.8 | 79.0 | 75.0 | 80.3 | 76.8 | 82.2 | 81.7 |

## 3.3.2 Spatial Patterns Management Indicator Habitats

The analysis of forest spatial management is primarily addressed in Chapter 3.2.2, Forest Spatial Patterns. In this section, spatial management is interpreted in terms of species associated with the key indicators. Key indicators evaluated along with sampling of some associated species of concern are: edge density (deer, American robin and cowbird); and size and amount of large forest patches (goshawk, black-throated blue warbler, and four species of lichen).

Spatial diversity, as a result of spatial management, is a summary measure of the desired condition of each Forest. Spatial diversity results in greater representation of ecosystem structure, processes, and functions that were once more common within the landscape and inherently benefits associated wildlife species. Reduction in disturbance rates would begin to change recent past effects on forest special patterns more quickly than others.

On the Chippewa NF, Alternatives B, D, and F make the greatest short-term and long-term changes in the spatial diversity within the forest to a greater degree than the other alternatives. Alternatives G and E continue to make long-term increases in the spatial diversity although temporally and quantitatively slower than the above alternatives. Alternatives A and C continue recent downward trends in changes to forest spatial patterns and decreasing spatial diversity.

Alternatives B, D, F, and G on the Superior NF make the greatest long-term changes in the spatial diversity with the forest and work towards the desired conditions of spatial diversity with inherent wildlife species. The rates of disturbance in Alternative E, combined with the landscape trends may limit change in spatial diversity. Alternatives A and C continue recent downward trends in changes to forest spatial patterns. Rates of disturbance predicted combined with landscape trends would limit these alternatives to maintain species that require interior forest or large mature upland forest patches.

## 3.3.3 Lake and Stream Health Management Indicator Habitats

The Chippewa and Superior NF include a wide variety of aquatic habitats from large lakes to slow or fast flowing streams to seasonal ponds and intermittent streams. Each provides habitat for diverse assemblages of both aquatic and terrestrial species.

Key indicators evaluated are those that address the trend of watershed impacts from the transportation system and the amount of riparian timber harvest and its affect on coarse woody debris in riparian zones. For a description of key indicator effects on watersheds, fish habitat and riparian areas, see section 3.6.2, Riparian and Fish Management. The key indicator effects on wildlife are described in this section.

On both Forests, water quality, as measured by its chemical attributes, of most lakes and streams is generally good to excellent. No landscape scale assessment exists to date to measure water ecosystems quality in terms of functional attributes such as channel stability, stream flow, riparian conditions, water temperature, habitat connectivity, sedimentation, and others. The overall health of lakes and streams may be affected by management activities and land use such as vegetation management, road, trail, and recreational development, and landowners and managers as they implement land use and management activities.

All alternatives provide sufficient habitat to maintain viable populations of species, and provide people with sufficient habitat and water quality for known recreational and social uses.

## 3.3.4 Threatened and Endangered Species

The DEIS for forest plan revision analyzes impacts to the three threatened species that occur on both the Chippewa and Superior National Forests: Canada lynx, gray wolf, and bald eagle. This analysis summarizes the findings of the more detailed draft Biological Assessment (planning record).

Effects analysis indicates that all alternatives provide sufficient or greater than sufficient habitat and environmental conditions to support conservation of all three threatened species. All alternatives would continue to provide a high likelihood that gray wolf and bald eagle populations would continue to be viable and that their habitats would remain well-distributed on the National Forests. Canada lynx is known to occur and breed on the Superior and is likely present on the Chippewa, but there is uncertainty about whether or not populations are viable over the long term. However, all alternatives provide for well-distributed habitats to support viability.

The alternatives are expected to support recovery of threatened species through incorporation of management direction (including objectives, standards, and guidelines) that addresses conservation of species in two important ways. First, the alternatives promote the proactive conservation of lynx, wolf, and eagle and their habitats by maintaining or enhancing extensive areas of suitable habitat and by maintaining or enhancing ecosystems on which the species depend. Secondly, conservation measures of all alternatives identify actions to reduce or, where possible, eliminate potential adverse effects or risks to the species and their habitat.

For gray wolf and bald eagle, alternatives incorporate conservation management guidance based on the Recovery Plan for the Eastern Timber Wolf and the Minnesota Wolf Management Plan (1992) and Northern States Bald Eagle Recovery Plan (1983).

No recovery plan yet exists for Canada lynx. Alternatives considered and incorporated recommendations based on those presented in the Lynx Conservation Assessment and Strategy and its subsequent modifications, which represent the best available science at a national level. The national measures have been modified to be applicable to Minnesota and the specific conditions on the Chippewa and Superior National Forests.

Although all alternatives proactively promote threatened species conservation and provide measures to reduce risks to the species, the alternatives still are likely to have adverse effects to lynx, wolf, and eagle some time during the life of the plan. However, the adverse effects are not likely to jeopardize the species' continued existence. Additionally, for some aspects of threatened species' habitat such as vegetation conditions, the alternatives, to varying degrees, may have overall beneficial effects, This determination is based on consideration of the following factors:

- *Potential for direct or indirect adverse effects from management activities*. Even with the best efforts made to reduce risk to lynx, wolf, and eagle and their habitat on National Forest lands, management activities may cause direct or indirect adverse effects (for example, habitat loss or alteration, disturbance at den or nest sites, vehicle collision, shooting).
- *Uncertainty about timing and location of expected land management activities*. Alternatives do not prescribe the specific timing and location of activities, therefore there is a level of uncertainty associated with potential environmental consequences.
- *Uncertainty associated with cumulative effects.* This includes cumulative effects, as well as other impacts that may be indirect effects of National Forest management.
- *Uncertain status of lynx population and habitat.* Knowledge and current science from this and other regions provide basic understanding of lynx's habitat needs, but there is much more to learn in order to understand lynx-habitat relationships and the direct, indirect, and cumulative effects of management on the National Forests in Minnesota. Our understanding of current population status is also uncertain. While we know that lynx occur on the National Forest and breed on the Superior, it is difficult to predict population trends, distribution, or other population dynamics.

The uncertainty associated with the factors listed above would be proactively addressed prior to project implementation. Site-specific surveys and environmental analyses would be conducted to identify potential adverse impacts and it is likely that many of those concerns could be reduced with site-specifc conservation measures.

In summary, all alternatives considered and incorporated recommendations from the Lynx Conservation Assessment and Strategy and Federal Recovery Plans for the wolf and eagle to proactively promote conservation of lynx and reduce risk to these species. As the plan is implemented, the National Forests would continue to monitor and evaluate

management activities to improve understanding of potential impacts of management activities and other human uses on threatened species and, in particular, to expand and improve information related to lynx occurrences. These actions, together with ongoing and future research should increase confidence and knowledge on threatened species ecology and the potential for ~~human~~ management activities to impact lynx, wolf, and eagle. Through adaptive management, the National Forests would improve management to increase the likelihood of overall beneficial impacts to threatened species.

## 3.3.5 Regional Forester Sensitive Species

Sensitive species are plants and animals for which there is a concern for population viability on the National Forests. They are designated by the Regional Forester. The evaluation of effects to Regional Forester sensitive species is conducted in detail in the draft Biological Assessment and summarized in the Draft EIS Chapter 3.3.5.

There are currently 107 terrestrial and aquatic sensitive species on the two National Forests. Sensitive species occur in a wide array of habitats that span all the major biological communities on the National Forests that are affected by management, as well as numerous site level habitat niches or microhabitats. Because of this, they provide opportunity to evaluate the likelihood to which alternatives address requirements to maintain viability and well-distributed habitats for all species and prevent a trend toward listing of any species.

All alternatives promote the protection, enhancement, or maintenance of sensitive species and the habitats upon which these species depend. The role each alternative would play in contributing to the conservation of sensitive species and habitats varies by alternative for many, though not all, species. For example, different alternatives provide differing amounts, quality, and distribution of suitable habitat. Despite differences, alternatives were designed to provide a likelihood of maintaining viability and well-distributed habitats. Where adverse impacts could not be avoided, management must not result in a trend toward listing.

For 102 of 107 sensitive species, the Forest Service been determined that all alternatives either 1) would have no impact on species, 2) would have beneficial effects on species, or 3) may impact individuals, but not be likely to cause loss of viability on the National Forests or trend toward federal listing under the alternatives. No species were determined to be at high risk of a trend toward federal listing as threatened or endangered. At project implementation, site-specific surveys and analyses would be conducted to identify conservation measures or other mitigations to minimize potential negative effects.

Of the 107 sensitive species, five species were determined to have a risk of a loss of viability in the planning area in one or more alternatives. These species include: northern goshawk, and black-throated blue warbler on the Chippewa and Superior (Alternatives A and C); spruce grouse (Alternative A and C) and bay-breasted warbler (Alternative A) on the Chippewa, and boreal owl on the Superior (Alternative A and C). As designed, Alternatives A and C pose a risk to viability of the above species. With modification or mitigations, these risks may be reduced to provide a higher likelihood that viability would be maintained.

## 3.3.6 Other Species of Concern

Other species of management concern include species designated under 36.CFR 219.19 as “management indicator species”, defined as species whose population changes are believed to indicate the effects of management. In addition to gray wolf and bald eagle addressed in 3.3.4 above, northern goshawk and white pine were designated as management indicator species and are addressed in this summary.

Other species of management concern because of their high public interest, American woodcock, white-tailed deer, and ruffed grouse, are addressed in Chapter 3.3.6 of the DEIS.

The National Forests in the western Great Lakes region, including the Chippewa and Superior, play a major role in contributing to the viability and well-distributed habitats of the northern goshawk. Habitat preferences are considered to be mature deciduous or mixed deciduous/coniferous forest in fairly contiguous blocks intermixed with younger forest and openings for production of prey species.

Indicators analyzed for the northern goshawk include the mature forest availability, patch size, and stand complexity. Each alternative provided different amounts, quality, and distributions of these habitat components, resulting in a range of effects that varies by alternative.

*Northern Goshawk*

On both the Chippewa and the Superior, Alternatives A and C would create habitat conditions that would add risk to maintaining viable populations of the northern goshawk. On the Chippewa, Alternative E and G result in a decrease in suitable habitat conditions, posing a greater risk for species viability section-wide than currently exists. On the Chippewa, Alternatives B, D, and F change and improve conditions in both the short and long-term to benefit the northern goshawk. Habitat provided by these alternatives on the Forest would be significant to the viability of the goshawk. On the Superior, Alternatives B, D, F, and G create short-term decreases and long-term increases to habitat conditions and habitat provided by these alternatives on the Forest would be significant to the viability of the northern goshawk. On the Superior Alternative E maintains adequate mature upland habitat in the short term and over the long term increases this habitat.

*White Pine*

White pine is a species of high public interest because of its many social, economic and ecological values. It is considered a keystone species, in that its overall effects on critical ecological processes and biodiversity are greater than would be predicted by its abundance. White pine indicators addressed in the Draft EIS are 1) acres of white pine forest type and age and 2) amount of white pine as a component of other forest types.

All the alternatives work toward the direction of increasing white pine as a forest component and increasing the quantity of older white pine.

See Tables 3.4, 3.5, and 3.6 on the next page for a numerical summary of the above discussion.

## 3.3.7 Non-native Invasive Species

Non-native Invasive Species (NNIS): Non-native species are any species that occupy an ecosystem outside of its historical range. Invasive species are any non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

There would be some general effects on terrestrial and aquatic NNIS common to all alternatives on the Chippewa and Superior NFs. NNIS plants and animals would continue to spread on both Forests. As they spread, they would continue to have negative impacts to the ecosystems where they are found. These potential impacts include: displacing native flora and fauna, changing the structure of native terrestrial and aquatic plant communities, disrupting aquatic food webs, disrupting hydrologic processes of wetlands, increasing erosion, impacting recreational use of lakes and rivers, and altering soils and soil processes. Infestations of NNIS would continue to exist at various densities and population sizes.

The potential for NNIS spread would vary among alternatives and can be measured by the miles of new maintenance level 1 and temporary roads and the level of water access. Because human-related introductions of NNIS depend on travel patterns, both of these measures indicate the level of access to the Forest under each alternative. Roads are related to new terrestrial NNIS infestations, while water access relates to the risk for spread of aquatic NNIS.

On the Chippewa National Forest, Alternatives F and D would result in the lowest risk for spread of NNIS. On the Superior National Forest, Alternatives B and D would have the least risk of spread. Alternatives C, A, and E would have the greatest risk of spread for both Forests, followed by G with a moderate risk of spread. Alternative F presents a moderate risk of spread on the Superior National Forest.

**Table 3.4. Goshawk-Indicator 1. Percentage of All Upland Forest in Mature/Older Upland Forest**

| National Forest | | Alt. A No Action | Alt. B | Alt. C | Alt. D | Alt. E | Alt. F | Alt. G |
|---|---|---|---|---|---|---|---|---|
| | | % | % | % | % | % | % | % |
| **Chippewa** | Existing | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| | Decade 2 | 31 | 52 | 28 | 51 | 44 | 51 | 47 |
| | Decade 10 | 28 | 77 | 36 | 88 | 55 | 72 | 64 |
| **Superior w/BWCAW** | Existing | 51 | 51 | 51 | 51 | 51 | 51 | 51 |
| | Decade 2 | 43 | 53 | 39 | 52 | 46 | 49 | 48 |
| | Decade10 | 52 | 74 | 53 | 80 | 60 | 67 | 64 |

**Table 3.5. Goshawk-Indicator 2. Percentage of All Upland Forest within 100 acre of Larger Mature/Older Upland Forest Patches**

| National Forest | | Alt. A No Action | Alt. B | Alt. C | Alt. D | Alt. E | Alt. F | Alt. G |
|---|---|---|---|---|---|---|---|---|
| | | % | % | % | % | % | % | % |
| **Chippewa** | Existing | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | Decade 2 | 19 | 36 | 19 | 35 | 28 | 35 | 31 |
| | Decade 10 | 17 | 63 | 25 | 74 | 37 | 56 | 47 |
| **Superior** | Existing | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | Decade 2 | 51 | 60 | 48 | 59 | 53 | 56 | 55 |
| | Decade 10 | 50 | 72 | 51 | 79 | 57 | 64 | 61 |

**Table 3.6 Amount of White Pine Forest Type in thousands of acres and by percent of total upland forest**
Totals for Superior are for land outside the BWCAW.‡

| | Alt. A No Action | | Alt. B | | Alt. C | | Alt. D | | Alt. E | | Alt. F | | Alt. G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acres** | **%** | **Acres** | **%** | **Acres** | **%** | **Acres** | **%** | **Acres** | **%** | **Acres** | **%** | **Acres** | **%** |
| **CNF** | | | | | | | | | | | | | | |
| Existing: 4.0 acres (1%); Range of Natural Variability Value‡‡: 8% | | | | | | | | | | | | | | |
| Dec. 2 | 4.7 | 1 | 7.3 | 2 | 8.0 | 2 | 11.9 | 3 | 8.9 | 2 | 8.4 | 2 | 9.1 | 2 |
| Dec. 10 | 5.4 | 1 | 43.4 | 10 | 18.9 | 4 | 48.7 | 11 | 28.7 | 6 | 35.0 | 8 | 32.1 | 7 |
| **SNF** | | | | | | | | | | | | | | |
| Existing 29.7 acres (3%); Range of Natural Variability Value‡‡: 9% | | | | | | | | | | | | | | |
| Dec. 2 | 30.3 | 3 | 32.6 | 3 | 33.6 | 3 | 40.4 | 4 | 33.3 | 3 | 34.8 | 4 | 34.4 | 4 |
| Dec. 10 | 31.1 | 3 | 77.4 | 8 | 31.5 | 3 | 74.4 | 8 | 57.8 | 6 | 78.1 | 9 | 69.2 | 8 |

‡Within the BWCAW white pine and red pine are combined and cannot be detected or measured separately. Based on vegetation classified by Natural Resources Research Institute, existing total of both types is estimated at about 22,000 acres (4% of total upland acres).

# 3.4 TIMBER

Forest Plan revision will determine the level of timber harvest that the Chippewa and Superior National Forests will supply while providing for ecological sustainability. Revision will also establish the acreage and location of land that is suitable for timber production. Suitable timberland is land on the Forests where timber harvest is a scheduled management practice.

Timber production is related to several other issues. Timber harvest has been shown to have positive and negative effects on social, economic, soil, water, visual, and recreation resources and some wildlife species depending on the amount, timing, and location. The intensity of these effects increase as harvesting increases.

## 3.4.1 Uneven-aged versus Even-aged Management

In general tree species, that require more sunlight to regenerate, survive and grow more successfully under even-aged management. Species that survive under shade can be managed with either even-aged or uneven-aged management. Clearcutting is a treatment that is often selected for aspen, aspen/fir, paper birch, jack pine, red pine, oak, spruce/fir, and lowland conifer forest type groups. Clearcutting is the most common type of harvesting in Minnesota. In recent years, the amount of trees retained within clearcut harvests has increased and more thinning is occurring. Shelterwood harvesting and uneven-aged management are expected to increase in the future due to Minnesota Forest Resource Council landscape committee recommendations, although even-aged management may still be the most common type of prescription.

It is not always easy to label a harvest as even-aged, uneven-aged, or clearcut. The difference between whether the treatment is labeled even-aged or uneven-aged would depend on whether most of the retained trees are removed within several years to allow the regeneration to grow. Thinning is most often an intermediate harvest occurring before a regeneration harvest (stand renewal) in an even-aged management system.

In the first decade, Alternatives C, A, and E would have the most even-aged treatments and Alternatives B, F, G and D would have the least. The alternatives range from about 53 percent even-aged treatment in Alternative B to about 97 percent even-aged treatment in Alternative C.

In the first decade, Alternatives A, C, and E have more clearcutting than Alternatives B, F, and G. Alternative D would not have any clearcutting. Alternative A would have about 70 percent clearcutting.

## 3.4.2 Timber Supply

Forest Service legal requirements limit the amount of harvest to a quantity that can be sustained over time, while still allowing a departure from this non-declining, even-flow concept to meet overall multiple resource objectives. The application of various vegetation treatments and allocations to various management areas affects the potential volume of timber produced during a particular time period under each alternative. The volume of timber produced under the alternatives has social and economic implications in terms of income, employment, and community stability.

In the first decade on both Forests (see Table 2.5), Alternative C would provide the most volume and Alternative D the least. The remaining alternatives would provide a range of volumes between Alternatives D and C.

By the third decade on both Forests, Alternatives C and D would provide considerably less volume than what is projected in the first two decades. The remaining alternatives would provide similar volumes to the first decade projections.

Overall, harvesting levels in Minnesota are not expected to change substantially in the foreseeable future. Reduced harvest levels on National Forest land the past several years, has resulted in an increase in harvest levels on private land and increased imports from Canada, Wisconsin and Michigan. This relationship between harvest levels on the National Forests and harvesting occurring on other ownerships is expected to continue.

### 3.4.3 Mix of Forest Products

Normally, sawmills require larger material identified as sawlogs, and mills making paper or panel board (oriented strand board and hardboard) use the less expensive smaller pulpwood size material. Aspen, balsam fir, and spruce are the most common species used by the paper mills. Aspen is the most common species used in making panel boards, although birch, pine, and maple are also used. The following species currently make up the bulk of the species used in sawmills in Minnesota: jack pine, aspen, red pine, red oak, and birch. White pine is a high value sawtimber species that has been in low supply.

Mills have typically adapted to supplies of different species and products. The 1994 Generic EIS study on Timber Harvesting and Forest Management in Minnesota indicates mills plan to replace aspen with hardwoods as the age class imbalance of aspen causes reductions in availability of aspen. The Minnesota Forest Resource Counsel landscape committee work seems to suggest softwood and sawtimber will increase. Species and products not supplied by the Forest Service are expected to stimulate increases in supplies from other ownerships and/or imports from Wisconsin, Michigan, and Canada.

The DEIS analysis estimated the mix of forest products by alternative over many decades because it takes a long-time to achieve desired conditions that would result in different types of species/products provided by the Forests. Different outcomes would result due to the application of different treatments across the management areas under each alternative.

Alternatives A and C would result in the highest volumes and the greatest amount of saw timber due to an emphasis on harvest treatments. Alternatives G and E would involve a greater mix of vegetation treatments that result in slightly lower sawtimber volumes than Alternatives A and C, but they still have an emphasis on timber harvest. Alternatives B and F would have a lower emphasis on mechanical treatments resulting in lower sawtimber volumes. Alternative D has the lowest volume because of the emphasis on natural processes and less intensive management.

There is a close relationship between the acreage of types of vegetation treatment projected for each alternative and the resulting volume. Alternative C would involve the highest acreage and Alternative A the next highest; both have large acres allocated to the General Forest Management Area. Alternative E involves more of a mix of management area allocations with a greater emphasis on timber harvest than Alternatives G, F, B, and D. Alternative F emphasizes longer rotations for harvest treatments as does Alternative B. Alternative B has a smaller acreage of suitable lands while Alternative D contains no acres in the General Forest Management Area allocation.

## 3.5 THE ROLE OF FIRE

Throughout the 20th century, fire management policy has continued to evolve in response to land and resource management needs, growing knowledge of the natural role of fire, and increased effectiveness of fire suppression. As knowledge, understanding, and experience expanded, it became apparent that complete fire exclusion was not the best management direction to support a balanced resource management program. This has led to the development of current Forest Service fire policy that recognizes prescribed fire as an important tool for fuel treatment, site preparation, and achieving ecological objectives

There is currently a higher than normal fuel loading across the Chippewa and Superior National Forests due to natural disturbances (winds, insects, disease) and the absence of fire on the landscape in recent history. In addition, there has been an increase in the number of people building homes and living in forested areas. This has created a need for aggressive fuels reduction projects. Forest plan direction is intended to help define those situations where management ignited prescribed fire will be appropriate based on resource, social, or economic concerns. Fire Management Plans further identify the planning processes addressing the potential effects and risks of management ignited prescribed fire; prescriptive criteria that best achieves forest plan desired conditions and goals; and may contain additional standards and guidelines to address local concerns.

Fire contributes to a host of functions and processes in ecosystems such as those listed below.

- Reduces accumulations of organic material, which in turn reduces wildfire hazard
- Recycles nutrients and alters soil chemistry
- Aids in decomposition
- Influences soil structure and stability
- Alters vegetative characteristics
- Modifies vegetative succession, providing early seral stages important to some wildlife

Fire effects can vary depending on fire intensity, severity, and frequency, which are the primary factors that define fire regimes. Fire-related effects occur with wildfire and prescribed fire. The intensity of impact correlates closely with the duration and size of the area involved. Fuel conditions, weather, and other factors also influence air quality effects.

The same amount of land, which may be burned at one time under dry conditions (a wildfire), can have a greater impact to air quality than burning the same amount of land in smaller parcels under moderate moisture conditions, over a longer period of time, with meteorology that gives good smoke dispersion (a number of smaller prescribed fires).

The effects of not using fire are consistent across the alternatives. Acres not treated (with fire, mechanical means, or a combination) would continue to advance toward climax successional stages, and understory seral species (shrubs and herbs) would decline or become more decadent. Landscape patterns would become more homogenous as succession advances. Ecosystem process and functions, such as nutrient cycling, in which fire was historically a primary agent, would be affected.

Overall, when considering in combination with other past, present, and reasonably foreseeable future actions in the vicinity of the Chippewa and Superior National Forests, none of the alternatives would be expected to result in adverse cumulative effects on any fire dependant ecosystem.

## 3.5.1 Fire Hazard

Fire hazard, the potential for a wildfire start, can be characterized based on species composition, age, and fuel characteristics that vary by alternative and time. Certain species and age classes, combined with scheduled harvests or treatments were divided into three classes: low, medium, and high relative fire risk. There is particular concern that increased fuel loading across the forest will lead to an increasing risk of large wildfires occurring within the wildland/urban interface areas. Identification of wildland/urban interface zones would be the same for all alternatives, as most growth is occurring on private lands adjacent to National Forest land. There are no anticipated increases in private residential structures on National Forest land (such as summer home areas) but a tremendous increase is anticipated on private lands near or adjacent to National Forest System lands. Comparing the location of wildland/urban interface areas with occurrence of high fire risk conditions indicates areas with the highest threat.

Alternatives A and C would result in the lowest fire risk over time due to the large acreage being treated through mechanical means. Alternatives E, F, and G represent the alternatives that show a moderate fire risk over time. The amount of timber harvest is less than alternatives A and C, but more than B and D. The number and size of wildland fires would be at or slightly above historical averages. Alternatives B and D result in the highest fire risk over time. There is little timber harvest in these alternatives that allows a change in species composition from a high fire hazard to a low fire hazard. The number and, more importantly, the size of wildland fires would increase over historical averages under these two alternatives but not to the levels of pre-European settlement.

## 3.5.2 Use of Management Ignited Fire for Fuel Reduction and Ecological Objectives

For each alternative, potential areas were identified for using prescribed fire that concentrated on the more fire dependent ecosystems on the two Forests: red and white pine as well as jack pine and black spruce/tamarack. Prescribed fire is applied differently in these types. The number of acres in the red pine and white pine landscape ecosystems determined the amount of acres available for surface fires (less intense fire). The number of acres in the black spruce, tamarack, and jack pine systems determined the amount of acres available for stand replacement fire (more intense fire). The primary emphasis for treatment would be in the jack pine systems with very few acres burned in the black spruce/tamarack systems

Alternatives A and C produce the lowest opportunity for management ignited fire due to the emphasis on mechanical treatments. The continued lack of fire in these fire dependant ecosystems would contribute to the decline of fire-dependent species and their associated ecosystems over time.

Alternatives E, F, and G produce a moderate opportunity for management ignited fire. Mimicking natural disturbances by utilizing fire on a small scale (Alternatives s E and G) and on a moderate scale (Alternative F) would somewhat contribute to the enhancement of these fire dependant species and their associated ecosystems over time.

Alternatives B and D produce the highest opportunity for management ignited fire due to the emphasis on mimicking natural disturbances by utilizing fire on a moderate scale (Alternative B) and on a large scale (Alternative D). Both alternatives would greatly contribute to the enhancement of these fire dependant species and their associated ecosystems over time.

### 3.5.3 Use of Management Ignited Fire for Site Preparation

Management ignited fire may be used to reduce slash on a site to prepare the site for planting or natural regeneration after harvest operations. It is an option to do mechanical site preparation.

Methods other than fire such as mechanical treatments would be used most often under Alternative C to prepare the areas for reforestation or natural regeneration. Alternatives A, B, E, and G would produce a moderate amount of opportunity acres. Methods other than fire (mechanical, etc) would be used more often to prepare the areas for reforestation or natural regeneration. Alternative F would produce the highest number of opportunity acres available for the use of management ignited fire for site preparation. Other methods (mechanical, etc) than fire would also be used to prepare the areas for reforestation or natural regeneration. Alternative D does not have acres that require site preparation.

## 3.6 WATERSHED HEALTH

The overall effects for watershed and riparian resources vary by the degree to which management activities occur within the planning horizon. Forest-wide desired conditions and objectives set the tone for managing specific resource areas and management area direction further defines how resources will be managed.

Even with these over arching principles and with the application of standards and guidelines, unavoidable effects to water, soil and riparian resources may occur as a result of implementation at the project level. Effects may include compaction, erosion and sedimentation. The movement of aquatic species may be affected as well as stream channel and lakeshore stability. Aquatic and riparian habitat disturbance and contamination of surface and groundwater may also occur. Many of these effects are short-term in nature but some entail a long-term commitment of resources that negatively effect watershed health.

In general, the differences in watershed effects between alternatives reflect the amount of harvest or fire treatment acres, miles of trail, and miles of roads and skid trails within areas where aquatic or watershed effects may be most detrimental. The effects of some alternatives also reflect the types of activities that are or are not permitted and can be related to the relative amount of land allocated to certain management areas.

Taking a very broad overview of the indicators used to gauge watershed health in the analysis, some central tendencies and groupings of alternatives that apply to both Forests become apparent. Specifically, relative to other alternatives being addressed in this analysis:

- Alternatives B and D most commonly represent the lowest level of potential negative effects to watershed health and riparian ecological function.
- Alternatives A and C most commonly represent the highest level of potential

negative effects to watershed health and riparian ecological function.
- Alternatives E, F, and G most commonly are arrayed somewhere mid-range in terms of potential negative effects to watershed health and riparian ecological function.

These central tendencies and groupings, however, tend to mask key exceptions that exist for some indicators. Also, even though these three bullet statements address overall relative differences between alternatives, they do not speak to the magnitude of the difference in effects that exist between alternatives for some indicators.

**Key exceptions to the three bulleted summary statements are highlighted below** in a discussion that groups the analysis indicators into the following five simplified categories:
- Those related to stream, lake, and wetland effects from the transportation system
- Those addressing the degree to which management area direction or the alternative theme provides for watershed management above a basic stewardship level
- Those that measure differences in soil quality, nutrient cycling, and hydrologic response for vegetation management treatments including prescribed fire
- Those that assess recreation effects on watersheds, lakes, and streams from winter and summer motorized trails, cross country use of RMVs, and water access;
- Those that assess riparian vegetation composition, age, and management intensity

## 3.6.1 Watershed Management

### Transportation (road) effects on lakes, streams and wetlands

Potential transportation-related effects include increased run-off caused by roads, associated sediment delivery, and effects to lakes, streams, and wetlands that are crossed or influenced by roads.

The differences among alternatives reflect the respective need for low maintenance level and temporary road construction associated with harvest activity. On both Forests, the higher level of harvest activity and roads associated with Alternatives A and C would results in the highest potential impacts on watershed health, while Alternative D would have the lowest potential impact. Alternatives E, G, F, and B are generally mid to lower in the amount of emphasis on harvest and associated road needs.

### Effects related to the amount of Forest allocated to management above the basic stewardship level for watershed health

All alternatives are consistent with laws, regulations, policies, and other stewardship guidelines such as those developed by the Minnesota Forest Resource Council for mitigating the impacts of forest management activities on water quality and riparian areas. Based on the mix of acreages assigned to management areas, some alternatives involve greater potential for proactive management to maintain or restore watershed health.

The portions of the Forests managed above the basic stewardship level ranges, across the alternatives, from 7 to 99 percent on the Chippewa NF and 41 to 97 percent on the Superior NF. On both Forests, Alternatives B, D, F, and G manage more than two-thirds of the Forests above the basic stewardship level based on the management area allocations.

### Vegetation management treatment, including prescribed fire, effects on soil and associated hydrologic effects

On both Forests, treatment acres related to timber harvest vary from 100,000's of acres to 1,000's of acres, across the seven alternatives, within decades during the planning horizon. Potential effects to the soils aspect of watershed health were first assessed based on the potential number of acres treated under each alternative and treatment-related developments including skid trails, temporary roads, objective maintenance level 1 and 2 roads, and landings.

The effect of prescribed fire on soil resources was also assessed. This assessment was also based on the projected number of acres treated. On the Chippewa and Superior NFs a maximum of 67,000 acres and 134,000 acres respectively would be treated within a decade.

An assessment was also made of the number of watersheds, on both the Chippwa and Superior NFs, where hydrologic reponse is expected to increase

above a specified threshold. That number varies from 6 to 0 and 9 to 0 on the two Forests respectively.

Cumulatively, most effect to soil and hydrologic response on the Chippewa NF would occur in Alternatives A and C. Alternatives E, F, and D would have a moderate effect, and G and B would have the least effect. On the Superior NF, Alternatives C and A would have the most effect, with E having moderate effects, and F, G and B and D the least effect.

***Key Exception to summary bullets:*** *Alternative D would have the highest potential negative effects from fire on soil quality while Alternatives A and C would have the lowest. This reflects the fact that Alternative D involves the highest (and Alternatives A and C involve the lowest) potential use of fire on an acreage basis. This effect of Alternative D needs to be recognized as a trade-off from other alternatives where vegetation management is more often carried out by mechanical means rather than by use of prescribed fire. The maximum potential acreage of fire treatment in Alternative D is considerably lower than the acreages of projected or potential mechanical treatment under other alternatives. This suggests that in the overall comparison of alternatives in terms of effects to watershed health it may be appropriate to place more concern on measurements of impacts to soil from mechanical treatment and transportation than from fire-related impacts.*

**Recreation effects from motorized trails and cross-country RMV use:**
Potential Recreational Motor Vehicle (RMV) use-related effects on watershed health are associated with increased run-off caused by trails, associated sediment delivery, and effects to lakes, streams, and wetlands that are potentially crossed or influenced by RMV trails or cross country use of RMVs.

In general, most effect from motorized use and cross-country travel would occur in Alternatives A and E on both Forest's due to levels of motorized recreation, potential trail miles, and development. Alternative D has the least effect on watershed and soil resources, likely because of its emphasis on non-motorized recreation and low levels of development.

**Effects from the maximum potential level of water access development**

Effects on watershed health from water access sites are related to the level of development included under each alternative.

Water access effects on the Chippewa and Superior NFs parallel each other where Alternative C and E have the most potential effect; Alternatives A, F and G have moderate effect; and Alternatives D and B have the least effect.

***Key exception to summary bullets****: Overall, for recreation effects on watershed health, Alternative E has either the highest or high potential negative effects relative to other alternatives. This results from the fact that Alternative E has the highest upper limit on potential snowmobile and ATV trail, high maximum potential development levels for water access, and relatively fewer restrictions on cross country snowmobile and ATV use.*

## 3.6.2 Riparian and Fish Management

**Effects related to riparian vegetation composition, age and management intensity**
On both Forest's, the alternative themes have dictated the management intensity within riparian areas and therefore the effects directly relate to alternatives that treat riparian area as a part of the scheduled timber harvest in contrast to those alternatives that prescribe special management considerations to riparian areas.

On both Forests, Alternatives C, A, and F have the most potential impacts to coarse woody debris, species composition and age, and Alternative D has the least impact.

***Key exception to summary bullets****: Among the "mid-range" alternatives, Alternative F would consistently result in greater potential for negative effects to riparian ecological function than either Alternatives E or G. This reflects the fact that the mitigative approach to riparian management is used in Alternative F, while the proactive riparian management approach is used in both Alternatives E and G.*

# 3.7 SPECIAL DESIGNATIONS

## 3.7.1 Potential Wilderness Designations

The Chippewa and Superior National Forests provide a range of existing forest settings, including areas inventoried as potential wilderness. The issue at hand is the allocation of how much designated wilderness the Forests should provide for a range of recreational opportunities and ecosystem values while at the same time providing for consumptive forest uses.

An inventory, including the original RARE II areas along with new inventoried areas, was completed and these areas were considered as potential wilderness system candidates. Two areas met the inventory criteria on the Chippewa NF and 30 areas on the Superior NF. These areas were allocated within the alternatives based on the inventoried area's characteristics and the theme of the alternative. Management of the original RARE II areas as identified in the Roadless Area Conservation Rule January 2002, will comply with all interim and final national direction.

The result of this forest plan revision process will not be the designation of wilderness. It may or may not include recommendations to Congress to have areas become wilderness. Congress must formally designate wilderness areas.

The Boundary Waters Canoe Area Wilderness (BWCAW) Management Plan will continue to provide direction for the BWCAW. This forest plan revision process will not change management direction in the BWCAW. The Forest Service will not respond to comments on the BWCAW Management Plan as part as this analysis.

Alternatives A, C, E and F on both Forests include no potential wilderness areas. The Chippewa NF apportions two potential wilderness areas in Alternatives B and D, while Alternative G contains one area. The Superior NF allocates 4 areas in Alternative G, 12 areas in Alternative B, and all 30 areas in Alternative D. Some of the areas contribute social and economic benefits in terms of providing non-motorized, remote areas for recreational opportunities and potential economic benefits to local communities. Some also contribute to the spectrum of natural resources within the Forests. Conversely, such allocations limit access and commodity use of these lands.

## 3.7.2 Potential Research Natural Area Additions

There would be some general effects of potential RNA (pRNA) designation common to all alternatives on the Chippewa and Superior NFs. The degree of the effect would depend on the acreage of pRNAs in each alternative. Each of the alternatives would manage a specific combination of pRNAs for potential long-term protection of these sites for research, monitoring, education, and biological diversity conservation. Management of the pRNAs would contribute to the national network of established RNAs. Opportunities for future and current research and monitoring of natural processes and conditions would be available. Ecological processes affecting vegetation, wildlife habitat, soil productivity, and water quality would occur with minimal human intervention. Management of pRNAs would result in differing amounts of land being withdrawn from the suitable timber base. Management activities and consumptive uses that threaten or interfere with the objectives or purposes for which the pRNAs were proposed would not be allowed.

The degree of effect of pRNA management would depend on the acreage of pRNAs in each alternative. On the Chippewa NF, Alternative F includes 10 pRNAs, Alternatives B and G include 9 pRNAs, Alternative D includes 8 pRNAs, Alternative E includes 2 pRNAs, and Alternatives A and C each include one pRNA. On the Superior NF, Alternatives B, D, and F include all 41 pRNAs, Alternatives G and

E include 26 and 11 pRNAs, respectively, and Alternatives A and C each include one pRNA.

On each Forest, the alternatives differ in the number of pRNAs that would be designated. The key differences in environmental consequences between alternatives are the degree to which the common effects described above would be manifested, which depend on the number of acres of pRNAs. In addition, Alternative A differs from the other alternatives because the pRNA in Alternative A would have a semi-primitive motorized ROS class objective, while the pRNAs in the other alternatives would have semi-primitive non-motorized ROS class objectives.

# 3.8 RECREATION

The Chippewa and Superior National Forests are important destination areas in the State of Minnesota, as well as the nation, because they provide unique forested and water related developed, dispersed, and remote recreation opportunities. The Forests are considering alternatives for providing a range of quality recreation opportunities to satisfy diverse public demands while maintaining sustainable forest ecosystems. The analysis of alternatives focused on settings for recreation and some key access issues on the Forests.

## 3.8.1 Recreational Opportunities and Forest Settings

The Chippewa and Superior National Forests are capable of providing a variety of recreation settings for non-motorized and motorized opportunities. The quantity, quality, and distribution of recreation opportunities depend on the mix of Recreation Opportunity Spectrum class objectives for each alternative. The Recreation Opportunity Spectrum (ROS) is a continuum of settings, activities, and opportunities related to recreation that are described in six categories that range from most to least developed.

Primitive and semi-primitive non-motorized ROS classes would provide dispersed, non-motorized recreation activities such as hiking, canoeing, and backpacking, in natural settings where there is little evidence of other people, more difficult access, and more opportunities for self-reliance.

Semi-primitive motorized and roaded natural ROS classes would provide more developed, motorized forms of recreation, such as camping and picnicking in developed sites, and motorized use of trails, in natural-appearing settings where there is usually evidence of other people, easier access, and few opportunities for self-reliance.

ROS class objectives were assigned to management areas in each alternative. When the BWCAW is included in the analysis, the Superior National Forest has a wider range of ROS classes than the Chippewa National Forest. The alternatives for the Chippewa National Forest and Superior National Forest outside the BWCAW are similar. In keeping with themes that emphasize more development and more intensive management, Alternatives A, C, E, and F have more roaded natural ROS class objectives than Alternative G, B, or D. Alternatives B emphasizes lower levels of development and management activity than Alternative G. Alternative D has the lowest emphasis on development and management activities and results in the highest level of semi-primitive ROS class objectives.

## 3.8.2 Scenic Quality

Scenery is an integral component of forest settings and a prime influence on the quality of a Forest visitor's experience. Typically, it is alterations to vegetation and landforms that result in the most obvious and considerable effects to the scenic resource. The Forest Service uses the Scenery Management System as a framework to integrate scenic resources into the forest planning process.

Scenic integrity is a key concept within the Scenery Management System. Scenic integrity is defined as the state of naturalness, or conversely, the state of disturbance created by human activities or alteration. The highest scenic integrity ratings are given to those landscapes with little or no deviation from the "natural" landscape character valued by constituents for its aesthetic appeal. The lowest ratings are given to those forest landscapes whose natural character is most heavily altered by management activities.

When developing the Forest Plan revision alternatives, scenic integrity levels were allocated to areas in the Forests based upon the theme of each respective alternative and how important a role scenic integrity plays in that theme as compared to the other resources being managed for on the Forest's land base. This includes consideration of management activities in visually sensitive travelways such as roads, recreation sites, trails, major rivers, and lakes. The portion of the Superior National Forest within the BWCAW was not part of the analysis area.

Alternatives A ,C, and F reflect less of an emphasis on providing the highest quality scenery than all the other alternatives and would allow for more obvious human-introduced management elements into the landscapes. This is related to higher levels of vegetation management, fewer areas designated to less intensive management, and an orientation towards more developed recreation opportunities.

Alternatives E and G result in similar scenic integrity levels with an overall relative ranking that puts them approximately mid way between the highest and lowest ranked alternatives. Both involve similar levels of vegetation management and recreation. However, under Alternative G, timber harvesting activities are intended to mimic the natural disturbance patterns of the surrounding ecological land types with a resulting slight increase in scenic integrity over Alternative E.

Alternatives B and D result in the highest scenic integrity levels with an emphasis on natural-appearing landscapes over time. Under Alternative D there is an emphasis on managing for older age classes and an increase in Research Natural Areas that result in fewer noticeable human-caused disturbances. Alternative D reflects the highest emphasis on providing natural appearing landscapes over time. Virtually no management –related disturbance will occur after the first decade.

## 3.8.3 Recreational Motor Vehicles

There is debate locally and nationally about the level of Recreational Motor Vehicle (All-terrain vehicles, Off-road vehicles, Off-highway motorcycles, and Snowmobiles) use on National Forests that would provide an adequate range of recreational opportunities while not adversely affecting the environment. The alternatives addressed this issue by describing Recreational Motor Vehicle opportunities on trails, roads, and cross-country.

All action alternatives would provide similar management direction for Recreational Motor Vehicles use on Forest System roads. Licensed and street-legal Off-road vehicles and Off-highway Motorcycles would be allowed on Forest System roads. Snowmobiles would be allowed on unplowed roads. In general, ATVs would be prohibited on higher standards roads. Project-level decisions would determine appropriate ATV use on existing low standard roads. Public motorized use would be prohibited on roads constructed during the Proposed Plan period.

Cross-country ATV travel would be prohibited in the alternatives except the Superior National Forest Alternative A where that use would continue to be allowed, and in Alternatives C and E where that use would be allowed only for big game retrieval and furbearer trapping access in most management areas. Cross-country snowmobile travel would continue to be prohibited in all alternatives on the Chippewa National Forest and in the Superior National Forest Alternative D, but allowed in most management areas in the other alternatives on the Superior National Forest.

New trails specifically designed for Off-road vehicles and Off-highway motorcycles were not addressed. Off-highway motorcycle (dirt bikes) users may be allowed on some designated All-terrain vehicle (ATV) trails where the standards for the vehicles are similar. Off-road vehicle (four-wheel drive vehicles) users would be encouraged to use existing low standard roads that are open to the public. The maximum miles of potential new ATV and snowmobile trail that may be built in the next 10 to 15 years were addressed for each alternative. Alternative D would not provide new motorized trails. Alternative B would provide very little new motorized trail. Alternatives F and G would nearly meet estimated demand while Alternatives A, C, and E would meet estimated demand for additional motorized trails on the Forests.

## 3.8.4 Water Access

The Chippewa and Superior National Forests are known regionally and nationally for their high quality water-related recreation opportunities. The access

sites to bodies of water is a key to providing the water related recreation activities and experiences desired by the public. Slightly over half of the lakes on each Forest have some form of access. Although boating use has remained stable in Minnesota, the Forests continue to receive some requests for improvements at existing sites or for the development of new water access sites. The requests sometimes reflect a desire to expand existing water access sites in order to accommodate a trend of larger boats and motors.

The maximum number of new or expanded water access sites would be the same for each alternative, except Alternative D on the Chippewa National Forest where no new water access would be developed. Over the next 10 to 15 years, in the remaining alternatives, a maximum of 5 new or expanded water access sites may be developed on the Chippewa National Forest, and 10 on the Superior National Forest. This potential development would meet the anticipated demand for additional or expanded accesses, except in Alternative D on the Chippewa National Forest.

The public could expect to see different kinds of facilities in each alternative. Consistent with the theme of each alternative, facility levels of development would range from low (such as water-side trails and carry-in accesses) to moderate (such as small picnic areas and single-lane gravel surfaced ramps) to high (such as toilet buildings and double-lane concrete ramps).

All alternatives could provide a variety of facility development levels, however, they would tend towards the following: In Alternatives B and D (on the Superior National forest), the public would see low facility development levels. In Alternatives F and G, the public would see moderate facility development levels. In Alternatives A, C, and E, the public would see high facility development levels. The spectrum below shows how the alternatives compare in providing low to high facility development levels at new or expanded water access sites.

# 3.9 SOCIAL AND ECONOMIC SUSTAINABILITY

## 3.9.1 Economic Stability of Local Communities and Social Sustainability

The Chippewa and Superior National Forests contribute in a variety of ways to the social and economic stability of local communities. Forest Plan revision may affect this mix of uses, values, products, and services. Forest management must consider stability contributions with ecological sustainability when making project decisions.

The analysis of alternatives for Forest Plan revision reviewed both quantitative and qualitative data and information within the analysis of social and economic sustainability. Economic quantitative indicators included employment and income by program area and industry, net present value, county income from National Forest revenues, and county diversity (Shannon-Weaver Index of County Diversity). Counties in and around the National Forests rely to some degree on income provided as a result of revenue generated by the Forests. Some counties may also be more economically resilient to changes in the supply of natural resources.

Most of the economic data derived from the economic model used for Forest Plan revision analysis indicated that Alternative A and C provided for the most income and jobs, while D provided for the least on both Forests. The analysis found the alternatives contribution of jobs and income fairly consistent between indicators.

Measurements of social stability describe potential changes to special places, traditional and culturally important areas, forest access, and community social factors. The components of these indicators are discussed more in detail within other parts of the analysis such as effects to recreation and timber resources. The changes suggested by alternatives will be compared by individuals and communities to the existing condition of the forest they are familiar with. Many of the changes within the natural resources would not be noticeable in the first decade, but would become more apparent as time goes on. Many of the changes among alternatives and changes from the existing forest conditions can be generally summarized by looking at the intensity of forest management, including amount of access roads and trails and emphasis on treatments that favor early successional forests.

In general, each alternative proposes change from the existing condition and moves the Forests toward the theme of the alternative. People would respond to changes according to their values, needs and desires. People that value conditions similar to the existing condition would likely appreciate Alternatives A and C; while there are other people that would likely value the distinctly different management emphasis of Alternative D. Alternatives B, E, F, and G would provide for different settings as compared to the existing conditions, yet they also continue to use a mixture of natural resource and access options.

## 3.9.2 Heritage

Significant differences in effects to heritage resources by alternative implementation are not expected. Because law, regulation, and policy explicitly control heritage resource management on federal lands, forest management practices and their effects would not differ substantially among the alternatives.

Forest management projects may cause surface disturbances and bring additional people in contact with heritage resources, but the difference between alternatives would remain low because of the protection and mitigation measures common to all alternatives.

In general, alternatives that result in more acres of planned and budgeted management activities could reduce adverse cumulative effects to some degree, due to an increase in inventory and evaluation. However, this additional management may also bring more possibility of inadvertent damage. Again, those protection and mitigation measures common to all alternatives provide for identified site integrity.

## 3.10 Summary of Environmental Effects, Outcomes, and Outputs

**Table 3.10.1 Comparison of Effects, Outcomes, and Outputs - CHIPPEWA NF**

| Issue | Units | Alternatives | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | | E | | F | | G | |
| | Decade | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 |
| **VEGETATION** | %Conifer | 28 | 31 | 34 | 57 | 39 | 36 | 35 | 58 | 34 | 44 | 34 | 52 | 34 | 51 |
| | %Deciduous | 72 | 69 | 66 | 43 | 61 | 64 | 65 | 42 | 66 | 56 | 66 | 48 | 66 | 49 |
| Vegetation Condition in Decades 2 & 10 | Upland % 0-10 yrs. | 13 | 16 | 4 | 4 | 14 | 15 | 4 | 2 | 8 | 10 | 5 | 6 | 7 | 7 |
| | Upland % 100+yrs. | 11 | 18 | 14 | 51 | 9 | 22 | 14 | 53 | 12 | 36 | 14 | 50 | 13 | 38 |
| ***RIPARIAN AREA VEGETATION*** | % Old Growth Age Class in forested portion of combined inner and outer RMZs | 23 | 49 | 33 | 75 | 22 | 51 | 32 | 74 | 33 | 71 | 32 | 55 | 32 | 71 |
| *Vegetation Condition at end of Decades 2 & 10* | % Long Lived Species in forested portion of inner RMZs | 67 | 77 | 72 | 100 | 66 | 74 | 72 | 100 | 68 | 100 | 71 | 91 | 72 | 100 |
| | % Long Lived Species in forested portion of outer RMZs | 64 | 72 | 69 | 91 | 65 | 73 | 70 | 87 | 67 | 81 | 69 | 85 | 65 | 78 |
| **TIMBER** | Ratio of sawtimber to pulpwood for decade 1 | 29:71 | | 34:66 | | 26:74 | | 16:84 | | 33:67 | | 29:71 | | 35:65 | |

## Table 3.10.1 Comparison of Effects, Outcomes, and Outputs - CHIPPEWA NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| **WILDLIFE** | What habitat is emphasized in the alternatives | Provides habitat mostly for species associated with young, early successional forests and edges. | Landscape is dominated by habitat for species associated with older forest, later successional forest, and interior areas. | Provides habitat mostly for species associated with young forests, early successional forests, and edges. | Provides habitat for species associated with older forest, later successional forest and interior areas. | Provides habitat for species associated with a variety of forest conditions and successional stages. | Habitat characteristic of natural disturbance regime. Older forests, but some ecosystems dominated by habitat associated with early successional species. | Provides habitat for species associated with a variety of forest conditions and successional stages. Habitat zoned by management area. |
| Older Forest and Fragmentation | How older forest is provided for in the alternatives | Wildlife standards and guidelines | Landscape ecosystem objectives; MA allocations: all SMCs, all pRNAs, potential wilderness; Standards and guidelines | Landscape ecosystem objectives; Some extended rotation; Standards and guidelines | Landscape ecosystem objectives; Non-suitable land MA allocations: Minimum Management Natural Areas, all pRNAs, all potential wilderness; Standards and guidelines | Landscape ecosystem objectives: Standards and guidelines | Landscape ecosystem objectives: MA allocation: all pRNAs; Standards and guidelines | Landscape ecosystem objectives: MA allocation: upper level SMCs and some potential wilderness; Standards and guidelines |
| Old-growth | MA acres contributing to old-growth | 27,941 | 248,586 | 41,002 | 649,821 | 96,981 | 84,591 | 169,685 |

## Table 3.10.1 Comparison of Effects, Outcomes, and Outputs - CHIPPEWA NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| **FIRE RISK** | Fire Risk Index | Low | High | Low | High | Moderate | Moderate | Moderate |
| **RIPARIAN MANAGEMENT** | Management Approach | Mitigative Approach | Proactive Approach & Riparian MA | Mitigative Approach | Proactive Approach | Proactive Approach & Riparian MA | Mitigative Approach & Riparian MA | Proactive Approach & Riparian MA |
| **WATERSHED**<br><br>Potential Impacts of New System and Temporary Roads | % of 6th level watersheds that increase in riparian road interaction class at end of 2nd decade | 13 | 9 | 14 | 8 | 10 | 10 | 11 |
| **RECREATION**<br><br>Recreation Opportunity Spectrum Class Objectives (% of total acres) | Semi-primitive Non-motorized | 2% | 29% | 2% | 58% | 3% | 3% | 5% |
| | Semi-primitive Motorized | 0% | 1% | 0% | 34% | 2% | 1% | 16% |
| | Roaded Natural and Rural | 98% | 70% | 98% | 8% | 95% | 96% | 79% |
| All Terrain Vehicle (ATV) Trails | Maximum miles of new designated trails | 60 | 30 | 60 | 0 | 90 | 60 | 60 |
| ATV use of FS Roads | Forest Service low standard system roads | Allowed | Allowed | Allowed | Allowed | Allowed | Allowed | Allowed |
| | Forest Service unclassified roads | Allowed | Prohibited | Prohibited | Prohibited | Prohibited | Prohibited | Prohibited |

## Table 3.10.1 Comparison of Effects, Outcomes, and Outputs - CHIPPEWA NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| ATV Cross-country use | | Prohibited | Prohibited | Big game retrieval & trapping access only | Prohibited | Big game retrieval & trapping access only | Prohibited | Prohibited |
| Snowmobile Cross-country use | | Prohibited | Prohibited | Prohibited | Prohibited | Prohibited | Prohibited | Prohibited |
| Snowmobile Trails | Maximum miles of new designated trails | 100 | 40 | 100 | 0 | 100 | 70 | 70 |
| Water Access | Development level of new access sites | High | Low | High | No new | High | Medium | Medium |
| **DESIGNATIONS** Potential Wilderness | Number of areas NFS Acres (0 acres existing) | 0 areas 0 | 2 areas 6,213 | 0 areas 0 | 2 areas 6,213 | 0 areas 0 | 0 areas | 1 area 2,727 |
| Special Management Complexes | NFS Acres | 0 | 169,098 | 0 | 0 | 0 | 0 | 85,595 |
| Potential Research Natural Areas (4 existing RNAs) | Number of areas NFS Acres | 1 area 769 | 9 areas 6,077 | 1 area 769 | 8 areas 5,542 | 2 areas 3,951 | 10 areas 9,261 | 9 areas 9,015 |
| **ECONOMIC** Jobs | Total Jobs in 2012 | 20,029 | 16,822 | 19,408 | 13,285 | 19,089 | 16,309 | 18,821 |

| Table 3.10.1 Comparison of Effects, Outcomes, and Outputs - CHIPPEWA NF | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Issue** | **Units** | **Alternatives** | | | | | | |
| | | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| Labor Income | Total Labor Income in 2012 ($ million) | $517.1 | $412.6 | $500.4 | $300.5 | $485.3 | $397.1 | $476.0 |
| **ROADS** (miles decade 1) | Total Maintenance Level 1 (324 existing) | 155 | 152 | 156 | 140 | 155 | 151 | 154 |
| | Temporary | 473 | 262 | 653 | 183 | 324 | 237 | 304 |

## Table 3.10.2. Comparison of Effects, Outcomes, and Outputs – SUPERIOR NF

| Issue | Units | Alternatives | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | | E | | F | | G | |
| | Decade | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 | Dec. 2 | Dec. 10 |
| **VEGETATION** | %Conifer | 42 | 52 | 45 | 80 | 42 | 53 | 50 | 81 | 44 | 72 | 46 | 72 | 47 | 67 |
| Vegetation Condition in Decades 2 & 10 (does not include BWCA) | %Deciduous | 58 | 48 | 55 | 20 | 58 | 47 | 50 | 19 | 56 | 28 | 54 | 28 | 53 | 33 |
| | Upland % 0-10 yrs. | 13 | 15 | 5 | 6 | 15 | 14 | 5 | 2 | 11 | 9 | 8 | 9 | 9 | 10 |
| | Upland % 100+ yrs. | 8 | 15 | 19 | 50 | 13 | 22 | 18 | 51 | 16 | 38 | 18 | 38 | 16 | 33 |
| **RIPARIAN AREA VEGETATION** | % Old Growth Age Class in forested portion of combined inner and outer RMZs | 41 | 49 | 50 | 69 | 36 | 48 | 48 | 70 | 48 | 63 | 46 | 59 | 49 | 67 |
| Vegetation Condition at end of Decades 2 & 10 | % Long Lived Species in forested portion of inner RMZs | 54 | 77 | 55 | 93 | 53 | 72 | 55 | 93 | 55 | 93 | 54 | 85 | 55 | 93 |
| | % Long Lived Species in forested portion of outer RMZs | 50 | 67 | 52 | 83 | 49 | 63 | 51 | 79 | 51 | 71 | 51 | 73 | 51 | 74 |
| **TIMBER** | Ratio of sawtimber to pulpwood for decade 1 | 19:81 | | 24:76 | | 18:82 | | 16:84 | | 20:80 | | 24:76 | | 23:77 | |

## Table 3.10.2. Comparison of Effects, Outcomes, and Outputs – SUPERIOR NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| **WILDLIFE** | What habitat is emphasized in the alternatives | Provides habitat mostly for species associated with young, early successional forests and edges. | Landscape is dominated by habitat for species associated with older forest, later successional forest, and interior areas. | Provides habitat mostly for species associated with young forests, early successional forests, and edges. | Provides habitat for species associated with older forest, later successional forest and interior areas. | Provides habitat for species associated with a variety of forest conditions and successional stages. | Habitat characteristic of natural disturbance regime. Older forests, but some ecosystems dominated by habitat associated with early successional species. | Provides habitat for species associated with a variety of forest conditions and successional stages. Habitat zoned by Management area. |
| Older Forest and Fragmentation | How older forest is provided for in the alternatives | Wildlife standards and guidelines | Landscape ecosystem objectives; MA allocations: all SMCs, all pRNAs, potential wilderness; Standards and guidelines | Landscape ecosystem objectives; Some extended rotation; Standards and guidelines | Landscape ecosystem objectives; Non-suitable land MA allocations: Minimum Management Natural Areas, all pRNAs, all potential wilderness; Standards and guidelines | Landscape ecosystem objectives: Standards and guidelines | Landscape ecosystem objectives: MA allocation: all pRNAs; Standards and guidelines | Landscape ecosystem objectives: MA allocation: upper level SMCs and some potential wilderness; Standards and guidelines |
| Old-growth | MA acres contributing to old-growth | 1,000,003 | 1,589,419 | 1,000,302 | 2,208,421 | 1,119,449 | 1,033,214 | 1,178,929 |

## Table 3.10.2. Comparison of Effects, Outcomes, and Outputs – SUPERIOR NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| **FIRE RISK** | Fire Risk Index | Low | High | Low | High | Moderate | Moderate | Moderate |
| **RIPARIAN** | Approach | Mitigative Approach | Proactive Approach | Mitigative Approach | Proactive Approach | Proactive Approach Riparian MA | Mitigative Approach | Proactive Approach |
| **RIPARIAN MANAGEMENT** | Management Approach | Mitigative Approach | Proactive Approach | Mitigative Approach | Proactive Approach | Proactive Approach & Riparian MA | Mitigative Approach | Proactive Approach |
| **WATERSHED**<br><br>Potential Impacts of New Summer System and Temporary Roads | % of 6th level watersheds that increase in riparian road interaction class at end of 2nd decade | 17 | 11 | 22 | 7 | 14 | 10 | 15 |
| **RECREATION**<br><br>Recreation Opportunity Spectrum Class Objectives (% total acres) | Primitive | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % |
| | Semi-primitive Non-motorized | 29% | 59% | 28% | 64% | 29% | 31% | 30% |
| | Semi-primitive Motorized | 5% | 5% | 6% | 29% | 8% | 8% | 16% |
| | Roaded Natural and Rural | 61% | 31% | 61% | 2% | 58% | 56% | 49% |
| All Terrain Vehicle (ATV) Trails | Maximum miles of new designated trails | 60 | 30 | 60 | 0 | 90 | 60 | 60 |
| ATV use of FS Roads | Forest Service low standard system roads | Allowed | Allowed | Allowed | Allowed | Allowed | Allowed | Allowed |

## Table 3.10.2. Comparison of Effects, Outcomes, and Outputs – SUPERIOR NF

| Issue | Units | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| | Forest Service unclassified roads | Allowed | Allowed | Allowed | Prohibited | Allowed | Allowed | Allowed |
| ATV Cross-country use | | Allowed | Prohibited | Big game retrieval & trapping access only | Prohibited | Big game retrieval & trapping access only | Prohibited | Prohibited |
| Snowmobiles Cross-country use | | Allowed | Allowed | Allowed | Prohibited | Allowed | Allowed | Allowed |
| Snowmobile Trails | Maximum miles of new designated trails | 90 | 50 | 90 | 0 | 130 | 90 | 90 |
| Water Access | Development level of new access sites | High | Low | High | Low | High | Medium | Medium |
| **DESIGNATIONS**<br>Potential Wilderness (814,400 acres existing) | Number of new areas<br>NFS Acres | 0 areas<br>0 | 12 areas<br>17,481 | 0 areas<br>0 | 30 areas<br>60,534 | 0 areas<br>0 | 0 areas<br>0 | 4 areas<br>3,672 |
| Special Management Complexes | NFS Acres | 0 | 345,751 | 0 | 0 | 0 | 0 | 183,302 |
| Potential Research Natural Areas (1 existing RNA) | Number of areas<br>NFS Acres | 1 area<br>792 | 41 areas<br>43,698 | 1 area<br>792 | 41 areas<br>369,041 | 11 areas<br>18,217 | 41 areas<br>44,378 | 26 areas<br>33,580 |
| **ECONOMIC**<br>Jobs | Total Jobs in 2012 | 19,395 | 17,239 | 20,209 | 15,521 | 18,638 | 19,040 | 18,717 |
| Labor Income | Total Labor Income in 2012 ($ million) | $497.9 | $424.8 | $527.6 | $371.0 | $472.8 | $484.7 | $473.7 |

| Table 3.10.2. Comparison of Effects, Outcomes, and Outputs – SUPERIOR NF | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Issue** | **Units** | **Alternatives** | | | | | | |
| | | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| **ROADS** (miles decade 1) | Total Maintenance Level 1 Roads (883 existing) | 1,005 | 952 | 1,056 | 943 | 985 | 967 | 975 |
| | Temporary Roads | 918 | 519 | 1,301 | 447 | 765 | 631 | 686 |